dcr
Massachusetts

DRAFT RESOURCE MANAGEMENT PLAN

NATIONAL MONUMENT TO THE FOREFATHERS

PLYMOUTH, MASSACHUSETTS

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Massachusetts Department of Conservation and Recreation
Division of Planning and Engineering
Resource Management Planning Program

Draft Resource Management Plan

National Monument to the Forefathers

Plymouth, Massachusetts

Massachusetts Department of Conservation and Recreation

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Path to Liberty

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All of the contemporary photographs in the publication were provided by Walker-Kluesing Design Group, except as otherwise noted.

Detail of main figure Faith

EXECUTIVE SUMMARY

Department of Conservation and Recreation Resource Management Plans

Chapter 21E, Section 2F of the General Laws of Massachusetts, which became effective in July 2003, requires the Commissioner of the Department of Conservation and Recreation [DCR] to submit management plans to the DCR Stewardship Council for the Council's adoption with respect to all reservations, parks and forests under the management of the Department. These management plans shall include guidelines for the operation and land stewardship of reservations, parks and forests, provide for the protection and stewardship of natural and cultural resources, and ensure consistency between recreations, resource protection, and sustainable forest management. The Commissioner shall seek and consider public input in the development of management plans, and shall make draft plans available for a public review and comment period through notice in the Environmental Monitor. Within thirty days of the adoption of management plans, as amended from time to time, the Commissioner shall file a copy of such management plans with the State Secretary and the Joint Committee on Natural Resources and Agriculture of the General Court. The Commissioner shall be responsible for implementing such management plans, with due regard for the above requirement.

The draft Resource Management Plan for the National Monument to the Forefathers has been prepared to meet this legislative requirement for this DCR property.

Significance of Undertaking

With the recent acquisition of the 10.5 acre National Monument to the Forefathers property, the Commonwealth now has possession of what is said to be the largest solid granite monument in the world. Completed in 1889, it was designed by the noted Boston architect, illustrator and sculptor Hammatt Billings. A vision commensurate with the stature of this monument is necessary for the appropriate management of this property.

Purpose and Goals of Draft Resource Management Plan

The purpose of the draft Resource Management Plan is to create a framework for future management decisions and capital improvements at the site. It provides an implementation plan for the entire property and its relationship to adjacent lands. The plan can be used as a guide for both long and short term planning for protection and reinforcement of sense of place, user needs, site improvements, and horticultural and maintenance improvements. It is intended for administrative, planning and maintenance staff, and for the general information of the diverse public and private groups interested in the life and character of the National Monument to the Forefathers.

The primary goal is to provide a facility management plan for this important site and monument that insures consistency between recreation and resource protection, and that insures sound and sustainable stewardship. Other goals include providing:

- Protection of the property's cultural and natural resources
- Restoration of the site's historic character including reinforcement of an overall image that is compatible with existing natural and historic assets
- Improvement of universal accessibility
- Identification of management and maintenance activities
- Identification of the necessary staffing levels, equipment and materials for maintenance of the site
- Identification of management and maintenance priorities including early action projects that may be implemented in the short term
- Identification of coordinated management guidelines for operations and land stewardship
- Consideration of the property's role vis-à-vis other nearby tourist destinations and public parks, notably Plymouth Rock and Myles Standish Monument State Reservation, both of which are managed by DCR.
- Increasing educational and passive recreation opportunities
- Increasing public understanding of the cultural, historic and natural significance of the property
- Identification of potential funding mechanisms and programs, including public/private partnerships
- Identification of ways for members of the community, like Friends groups, to remain or become involved with the ongoing maintenance and management of the property
- Agreements on equipment, personnel transfers, operational costs and assignment of specific management responsibilities

The Planning Process

This draft resource management plan builds upon two previous undertakings related to this property: A Conditions Assessment of historic masonry and iron elements prepared by Preservation Technology Associates, completed in June of 2003; and a Cultural Landscape Report and Preservation Recommendations prepared by the Massachusetts Department of Conservation and Recreation, completed in January 2004. The planning process began with: preparation of a topographic survey; and an on-site assessment and evaluation to ascertain changes that may have occurred since the preparation of the two previous reports. It also included a further assessment of current conditions, use and operations; review, evaluation and synthesis of historic and other information previously compiled; development of recommendations pertaining to protection of the property's natural, cultural and recreational resources, and restoration of the site's historic character; development of a prioritized and phased action plan for resource management activities with related costs; and identification of maintenance and management priorities and establishment of guidelines for management and maintenance including sound management of public access and recreational use. Each of these components was reviewed with Massachusetts Department of Conservation and Recreation staff in anticipation of a public review process.

Priority Findings and Recommendations

Priority findings were established in conjunction with the Department of Conservation and Recreation. The priorities for this project focus on improvements that will resolve public safety issues, protect historic resources, restore and enhance the prime assets of the park, enhance visitor use, and enhance the park and ease maintenance requirements.

Proposed improvements have been broken down into four priority categories to facilitate planning and budgeting requirements. The actual order of events will depend completely upon sources and availability of funds and the needs and desires of the Department of Conservation and Recreation. Priority categories can be combined or further subdivided as funds are available and as opportunities present themselves.

In projects for historic properties priority setting is a relatively straight forward matter, that is, insure public safety and protect historic resources first. Other issues come to the forefront like the need to maintain deteriorating infrastructure and maintaining an appropriate visual character for visitors. The highest priority items are typically related to issues of public safety, structural stability and protection of historic fabric. These items should be corrected first and as soon as funds allow this work to be accomplished. Medium priority improvements should be corrected next and generally relate to issues of security, preventing accelerated deterioration or damage which could lead to higher future costs, replacement of items which are expected to last less than five years, and repair or replacement of items that significantly detract from the appearance of a historic property. Lower priority improvements include cosmetic repairs and future considerations that can be delayed at least five years.

Priority Category One
Resolution of Public Safety Issues and Monument Protection

Security Lighting: Provide illumination for the monument in the form of flush mounted or low profile theatrical [dramatic] lighting to reduce vandalism of the monument while not significantly impacting historic appearance. Should the program for evening concerts be relocated to this site as discussed in Property Description and Uses under Activities/ Programs and Site Utilities, general area lighting may be desirable for public safety.

Conservation of Marble Bas-Relief Panels at the Monument and Clear Vandal Resistant Covers: Provide and install ventilated clear covers over the marble bas-reliefs on a year round basis. Conserve each bas-relief stone surface with a gentle poultice to remove soil and salts by a trained conservator. Stabilize and fill cracks. Restoration of weathered, blurred or lost detail is not recommended except that the missing chair leg at the "Signing of the Social Compact" relief should be restored.

Repair/Reset the Steps at the Path to the Dedication Panel: Reset the lower concrete step where the path meets Allerton Street. Remove and rebuild the granite steps and cheek walls above. Repair the broken step. Replace the foundation as required. Provide appropriate handrails.

Public Safety Improvements in Wooded Areas: Initiate sustainable forestry practices by maintaining a healthy forest as a backdrop for the monument. Commence a hazard tree mitigation program by removing volatile fuels [decayed matter on forest floor and underbrush] and public safety hazards [standing dead trees and dead limbs]. In addition, clean up wooded areas removing trash and debris. Some aspects of this work could be a potential volunteer project.

Staffing, Equipment and Materials: Provide the necessary staffing, equipment and materials for proper maintenance of the site.

Partnerships: Develop a MOU between the Commonwealth and the friends group.

Marble bas-relief panel

Priority Category Two
Restoration and Enhancement of the Prime Assets of the Park

Monument Conservation: The Faith figure, and the Monument as a whole, should undergo general masonry cleaning to remove soiling and specific stains. All of the mortar joints should be cut out and repointed. Inject small cracks. Provide the necessary stone dutchman repairs to secondary figure carvings. Reset loose stones at the bases of secondary statues and provide a weather cap between the back of secondary figure chairs and pedestal. At the "Law" figure remove and reset the displaced molding on the right side of the inscription course, and replace the fingers at the hand with stored and new components. Repair and recondition the lightning protection system.

Improve Views to Ocean: The view toward Plymouth Bay can be restored only with the cooperation of the property owner whose trees interrupt the sight line. Because the view is so important to the design of the monument and the experience of visitors, the property owner should be contacted to see if they would be willing to have selected trees removed and replaced with lower growing trees.

Pave Drives: The maintenance requirements of dealing with erosion, dust and dirt of the current gravel surface is significant. While gravel is a historically appropriate material, it is beyond the capacity of staff to provide adequate maintenance. A chip seal surface with the color of gravel will provide an appropriate rustic appearance that is compatible with the historic image. Maintenance requirements will be less with such a surface because the site is not plowed of snow in winter. When the drive is resurfaced, care should be taken to avoid concentrated flows of overland water.

Views to ocean from monument in April 2005

Restore Walks leading to and around Monument: The pedestrian path leading to the dedication panel was restored in the fall of 2003 and is in excellent condition. The pedestrian path leading to the statue of Liberty should be restored to a similar level by removing and resetting the historic asphalt gutter pavers, removing the concrete walks and turf center panel, and replacing them with chip seal to facilitate access and be compatible with the historic appearance of gravel. The pedestrian path leading to the statue of Morality, should be reconstructed to match that leading to Liberty in design and materials as it once did. The reconstruction of this path would recreate the symmetrical path design that was in place from ca. 1897 into the 1900s. It would also work well with the recommended vista clearing in the area discussed under views in the next priority section. At the base of the monument, the concrete area above the raised granite curb should be restored to lawn as it was historically. The asphalt area should be made a chip seal surface to restore the appearance of the historic gravel surface. An indication of the original broader diameter of the paved pedestrian area around the base of the monument should be provided in the form of a stone circular marker at the outer diameter of the original paved circle.

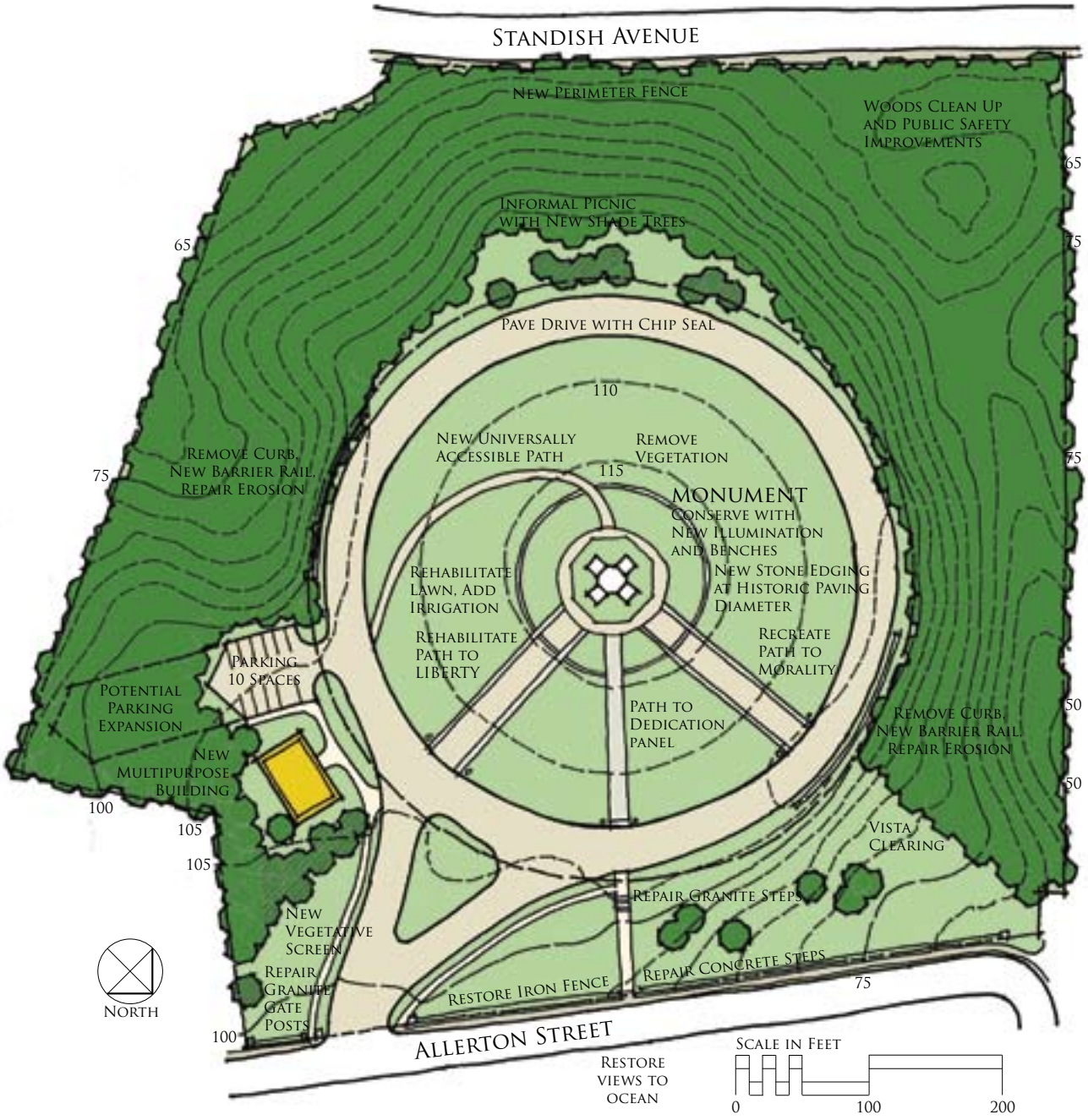
Complete Restoration of the Historic Iron Fence along Allerton Street: Reposition the iron posts that are not plumb and reset bases that have settled to proper grade and alignment. Repair cracked iron post bases. Reattach iron posts no longer fastened to base stones. Strip back the sediment covering the tops of granite bases to expose them. Prepare, prime and paint the ironwork.

Repoint Entrance Posts: These granite posts should be cleaned of organic material and joints should be cut out and repointed. Restore displaced base stones to their original position with rebuilding as required.

Views to ocean from monument in May 2005

Existing Conditions Plan
National Monument to the Forefathers
Plymouth, Massachusetts

Massachusetts Department of Conservation and Recreation
Walker-Kluesing Design Group
June 2005



Preliminary Site Rehabilitation Plan

National Monument to the Forefathers

Plymouth, Massachusetts

Massachusetts Department of Conservation and Recreation
Walker-Kluesing Design Group
June 2005

Priority Category Three
Use Enhancement

Improve Views to Monument: Restore the grounds in the immediate proximity of the monument to their historic appearance, which was open. All of the plantings introduced in the mid 1960s should eventually be removed such that the view of the monument is clear from all vantage points. Initiate selective vista clearing to improve views to the monument from Allerton Street after the turn from Court Street. Some aspects of this work could be a potential volunteer project.

Universal Accessibility Improvements: Provide designated universally accessible parking spaces. Provide a separate new walk from southeast side of monument across to back side. With gentle recontouring of the land to accommodate a 5% maximum gradient, this path should be virtually invisible from the entrance to the site and thus create the least visual disturbance of the historic image.

Replace the Garage and Restroom Facilities with a New Multipurpose Building: A new multipurpose facility, compatible with the historic nature of the site, would accommodate all of the needs of the park and meet the requirements of the anticipated desired user population and user activities. A new larger facility would be beneficial for equipment storage, staff space and interpretive components. With anticipated increased staff time on site, sanitary facilities would be highly desirable for staff and visitors as well. Provide a small number of designated parking spaces adjacent to the building. Maintain the water and sewer connections to the town system and extend the electric service to the new building.

Benches and Picnic Tables: Provide granite backless benches near the base of the monument to serve visitors and match the character of the benches that were once there. A few picnic tables near the multipurpose building would be appropriate both for staff and visitors.

Relocate Flagpole and Donation Box: In conjunction with the new building, relocate the flagpole in closer proximity to the building and outside of a primary view to the monument. Maintain the donation box in its current location until an interpretive program including interpretive signs is developed. At that time integrate the donation box into the overall signage system.

Interpretive Elements: The public profile of the property should be enhanced with increased programs and visibility. This requires staffing for interpretive programs, new programs, advertising of programs, joint programs with other entities in Plymouth, an improved sign system directing people to the park, and improved pedestrian connections to the park from downtown. While the site should remain focused on providing a passive recreation experience, providing interpretive programs and facilities is highly desirable. In addition, some of the scheduled activities and events that currently occur at Plymouth Rock, like summer evening concerts, summer festivals, etc., may be more appropriate at this site which has a much larger area. This would create a higher visitation level and expand the hours of use.

Improving the signs directing people to the site and providing interpretive information once on the site is highly desirable to publicize the site, provide better connections and directions to it, give it a better identity and enhance the visitor experience. The park identification sign should be maintained in its current location until the new building is implemented. At that time the location should be reconsidered. Regulatory information should also be provided as part of an overall sign system that is compatible with the historic nature of the site. If the need arises for additional structures on the grounds, like information kiosks and/or wayside signs, they should be sited so that they do not detract from the historic character of the landscape or interrupt views to or from the monument. All new structures/objects should be limited to areas outside the circular drive. Provide signs and/or handouts to expand the identification and interpretation of the historic and other components of the park. Develop interpretive programs that are appropriate to the site, but do not overlap or repeat interpretive themes or content provided at other nearby historic sites in Plymouth. It seems appropriate to focus on issues relevant to the monument and not dwell on the Pilgrims per se as they are well covered at other sites in the area. The interpretive program should be unique to the site and could focus on Billings, the conception, imagery and implementation of monument, stone and conservation work. It could provide insight into 19th century attitudes toward the region and site. The program could also provide a thematic link between this site and other DCR properties in southeastern Massachusetts like Borderland State Park, which shares an association with the Ames family with the National Monument to the Forefathers.

Staffing: Provide the necessary staffing and interpretive resources for visitor services and interpretation of the site.

Vegetation impeding view of monument from rear

Priority Category Four
Resource Enhancement

Replace Curbing with Barrier Rails: Remove the concrete curb and drainage structures on the outer edge of the circular drive and replace with an appropriate barrier rail that will provide a higher degree of public safety. This action will also significantly reduce down slope erosion conditions created by the curbing and drainage structures.

Erosion Repairs: Repair the erosion created by the point source discharges once the concrete curbing is removed.

Irrigation System: The openness of the maintained area in combination with the droughty nature of the soils and the drying effects of the summer sun makes it difficult to sustain and maintain lawns during the summer months, a peak visitation season. Extend the water supply to the area inside the circular drive for irrigation of lawn areas and monument maintenance.

Perimeter Fencing: Provide a perimeter fence of 6' high black vinyl clad chain link along all remaining unfenced edges to improve security and reduce, if not eliminate, vandalism of the monument, graffiti and on site dumping.

Improve Wooded Areas: Remove the invasive volunteer growth. Many are weak wooded trees and they present a public safety hazard. The removal of invasive vegetation [brier, poison ivy, etc.] could be considered an appropriate volunteer project.

Conserve/Relocate the Remaining Stone Site Features: Maintain the granite shells and bollards in their current locations. Reset them to upright condition on proper foundations. Remove the granite platforms and concrete post if an appropriate new function is not identified. Provide further study on the cut granite pieces to determine their age and origin, and determine an appropriate treatment for them. Place the granite marker in storage, off site, so as not to confuse visitors.

View of monument from Court Street

Long Term Priorities

Acquisition of the Monument House property on the opposite side of Allerton Street, in whole or in part: This would facilitate controlling the view from the monument to the ocean, restore the Monument House relationship to the monument, and facilitate the following recommendation.

Development of an easement or agreement with the Town of Plymouth to facilitate a potential pedestrian extension from the site to Court Street and downtown: This path extension could assist with and become part of the "Pilgrim Path" walking tour concept.

Priorities and Capital Improvement Cost Estimates

These estimates are presented with the priority categories described above. They should be considered preliminary in nature and used for discussion purposes only. Many items should be considered flexible because of the scale and level of detail development of this plan. Because of the probable long range nature of this project, a factor for inflation has been omitted. Inflation could easily double these estimates in a very short period.

It should be noted that the following costs are for budgeting purposes only. These estimates are in year 2005 dollars and are subject to change. Estimates reflect a public bid process as required by the Department of Conservation and Recreation. Although construction costs were very stable between 1990 and 1995, they increased substantially in recent years, but appear to be beginning to stabilize again. Some of these costs could be reduced with selected services provided by volunteer and/or Department of Conservation and Recreation forces.

Priority Category One Resolution of Public Safety Issues and Monument Protection [Early Action Projects] Cost estimate:	$276,000
Priority Category Two Restoration and Enhancement of the Prime Assets of the Park Cost estimate:	515,000
Priority Category Three Use Enhancement Cost estimate:	1,022,000
Priority Category Four Resource Enhancement Cost estimate:	307,000
Total Capital Improvements estimate:	$2,120,000

Refer to Implementation Plan section for further information and details.

Refer to Business Plan section for staffing, equipment and other operational costs.

Entrance from Allerton Street

THE PROPERTY

Property Basics

The National Monument to the Forefathers, the primary asset of the site, is located on a 10.665 acre, largely wooded hilltop parcel with frontage on Allerton Street and Standish Avenue, in a residential area near the center of Plymouth. The site is zoned as an R-15 residential district.

One of highest points in town, the site affords a now obscured view of Plymouth Bay to the northeast. Accessed from Allerton Street, the monument is encircled by a 30' wide drive. The drive is supported by pedestrian paths leading to the monument. The only other notable structures at the site are a modern garage with wood clapboard siding and a nonfunctional concrete block restroom facility. A historic iron rail fence with intermediate iron posts and granite end posts defines the Allerton Street edge. Most of the character defining features from the period of significance [1855-ca. 1897] remain and the site retains a high degree of historic integrity.

Other public historic open space resources in the vicinity include the nearby Plymouth Rock as well as Myles Standish Monument State Reservation.

Unique Aspects of the Property

The National Monument to the Forefathers is an 81' tall granite monument constructed by the Pilgrim Society over the course of three decades. It was completed in 1889 at a cost of $150,000. Designed by the noted Boston architect, illustrator and sculptor Hammatt Billings, it is said to be the largest solid granite monument in the world. The monument and site was owned by the Pilgrim Society until 2001 when it was deeded to the Commonwealth of Massachusetts and came under the care of the Massachusetts Department of Conservation and Recreation.

The Monument House on the opposite side of Allerton Street was purchased by the Pilgrim Society in 1900 to house a groundskeeper for the monument. It was sold into private hands about 1992.

Mission Statement

The vision for the National Monument to the Forefathers site is to expand public educational and passive recreation opportunities by increasing public understanding of the cultural, historic and natural significance of the property while resolving public safety issues, protecting the fragile aspects of the monument, restoring and enhancing the prime assets of the park, and enhancing the use and resources of the site.

View of monument from entrance, 2002

Management Goals and Objectives

The goals that follow describe broad aims or ideals for achievement. The associated objectives need to be achieved to meet the identified goals.

Recreate the scenic qualities of the historic landscape while resolving contemporary issues of public safety, universal access, security, appropriateness of use, maintenance, management and preservation.

To preserve the primary historic resource by conserving the monument.

To keep the monument as the focal point of the site and make it both visually and physically accessible.

To enhance scenic opportunities inside the park and as seen from adjacent streets.

To use vegetation to restore the scenery and historic style intended for the park.

To create healthy, long lived plant communities within the park.

To maintain adequate visitor and maintenance access to the site.

To provide pedestrian and universal access, and meet current safety standards while restoring historic character.

To maintain and reinforce the historic circulation systems.

To maintain the historic style of pavement materials.

To reconfirm the historic character of the site by restoring the Allerton Street fence.

To enhance the experience of visitors through attractive and appropriate site amenities.

To enhance the safety and security of visitors.

To enhance security of the property's cultural and natural resources.

To keep vandalism to a minimum.

To eliminate erosion and sedimentation conditions.

To provide utility services that would benefit security and maintenance of the park.

To accommodate utility services in a manner that is compatible with the historic image of the site.

Amend existing facilities, management policies and maintenance practices that are inconsistent with the original design intent and/or contemporary park needs.

To relocate or remove inappropriate facilities from sensitive areas.

To develop an ongoing vegetation management program.

To provide opportunities for better management and maintenance of the site through joint efforts of various public and private interest groups.

Increase the quality and quantity of passive recreation opportunities.

To enhance educational and passive recreation opportunities.

To provide interpretive programs serving all ages.

Path to Dedication Panel

PROPERTY DESCRIPTION AND USES

Natural Resources

Topography, Geology, Soils and Climate
Assessment
Topography: Sometimes referred to as Monument Hill, the upper central portion of this hilltop site, where the monument and access drives are located, is moderately sloped with an average gradient of about 12%. This slope is too steep for universal accessibility. Three sides of the site [north, west and south] have steeply wooded slopes. The steepest slopes occur just outside the circular drive with 1.5:1 slopes to the southeast and north, 2:1 to 2.5:1 slopes to the northwest and west, and 3:1 slopes to the southwest. Overall there is about a 69' vertical grade change across site with high point of about elevation 117 at the base of the monument and a low point of about elevation 48 toward the eastern end of the north property line. Erosion is evident on steep slopes at the outlets of two storm drainage pipes located outside the circular drive around the monument.

Geology and Soils: As a glacially formed fluvial deposit, soils are described as Plymouth-Carver by the USDA Soil Conservation Service. Composed of about 45% Plymouth soils, 40% Carver soils and 15% other soils, they are found primarily in the southeastern part of Plymouth County. The Plymouth soils have a higher percentage of coarse fragments [cobbles to boulder size] than Carver soils which typically lack the larger coarse fragments. Both soils are extremely droughty. They are excessively drained with low available water holding capacity, rapid to very rapid permeability and are not subject to flooding or ponding. They are extremely to strongly acid in soil reaction [pH 3.5 to 5.5]. These soils are poorly suited to woodland, cultivated crops and pasture because of the very low water holding capacity and low fertility. Irrigation is necessary for optimal yields. There are no major limitations related to the use of these soils as building sites although the large boulders associated with Plymouth soils may hinder excavation activities.

Testing of topsoil samples taken in April of 2005 found an acidic pH of 4.9, low to medium nutrient levels, normal micronutrient levels and low lead levels.

Climate: In a northern temperate climate, average temperatures at the site are moderated by close proximity to the ocean. They range from 29 degrees F in January to 72 degrees F in July. Average morning humidity ranges from 71% to 81% while afternoon humidity ranges from 53% to 60%. On an average monthly basis, there is a range of 9 to 12 days and 3.6" to 4.8" of precipitation. Snowfall averages about 50" per year.

Recommendations
Resolve accessibility without impacting the historic image of the site as discussed under universal accessibility. Repair erosion damage after the storm drainage pipes are removed as discussed under curbing.

From a vegetative standpoint, the openness of the maintained area in combination with the droughtiness of the soils and the drying effects of the summer sun makes it difficult to sustain and maintain lawns during the summer months, a peak visitation season. Tempered somewhat by relatively high humidity and the amount of precipitation, the lack of shade drys out the site during the heat of the summer. Even though there is a good depth of topsoil, lawns would benefit from an irrigation system in maintained areas. In addition, applications of limestone and potassium should be provided to reduce the acidity and improve the fertility of the soils.

Because these soils are associated with groundwater aquifer recharge areas, precautions should be taken to protect the aquifer in this South Coastal Watershed of Plymouth County.

Vegetation
Maintained Areas
Assessment
Vegetation in the maintained area of the site is simple and relatively sparse with lawn predominating. The topsoil depth is approximately 12" and it appears to be a sandy loam. The condition of the lawn varies from good to poor where there are areas of herbaceous materials.

Research indicates that the site remained relatively unplanted into the 20th century, creating a simple and austere setting for the monument. Existing vegetation in the maintained areas dates from a 4 phase planting scheme developed in 1965 and executed, at least in part, by 1967. It is a modern alteration to the historic landscape and does not possess historic significance. Slightly less than half of the Crabapples and Washington Hawthorns from that effort remain in 3 semicircular rows behind the monument. Originally comprised of 46 trees, there are 21 today. The surviving trees are in good to fair condition but limit views of the monument from the rear and, to a lesser extent, the sides of the monument. The loss is mitigated by the relatively short height of the trees in relation to the monument. A large Norway Spruce, the date of which is not known and it was not shown on the 1965 plan, is located near the northernmost Crabapples and is in good condition. It does not appear to be part of a larger planting plan. The narrow verticality of this tree will eventually compete visually for attention with the monument.

A hedge of heavily sheared junipers from the 1965 planting plan survives along the outside of the circular drive, to the northeast of the monument. The Junipers are in poor condition with winter damage. A large group of trees behind the Juniper hedge may also date from that planting effort. Groups of overgrown and heavily sheared Yews remain in three locations: a group of approximately 20 shrubs is located near the main vehicular entry on Allerton Street and a group of about 10 shrubs are located to each side of the granite steps along the pedestrian path from Allerton Street to the dedication panel. In addition, a single Yew is located near the garage, and a hedge of Yews, about 5' tall, is located along the north side of the restroom building. They are all in good condition. Boston Ivy is growing on the south entry post.

Recommendations

From a historic perspective, the grounds within the circular drive around the Forefathers' Monument were open, with the monument as the focal point. To restore the monument grounds to their historic appearance the plantings introduced in the mid 1960s should eventually be removed. There should be no plantings inside the circular drive at the site. The Crabapples and Hawthorns behind the monument should be removed as they decline so the historic landscape image is gradually restored and the view of the monument is clear from all vantage points. The adjacent Norway Spruce should be removed and not replaced for the same reason. As the Junipers decline, they should be removed and not replaced. They contribute to obstructing views into the site from the northeast. The groupings of Yews should also be removed and not replaced as they were not part of the historic plan for the site.

Given the droughty nature of the soils and the anticipated desire for "green" during the tourist season, providing an irrigation system and soil amendments would best meet site needs, desires and expectations. Other options considered include leaving the lawns as they are or providing an alternative vegetative material in place of lawns. Neither option was considered appropriate for a site of this historic stature.

Norway Spruce adjacent to monument

Wooded Areas

Assessment

To the north, south and west of the monument, the site is wooded with mostly deciduous trees, the largest of which is about 30" dbh. There is not much diversity of species in the wooded areas. They are primarily made up of Black Cherry, Black Locust, Norway Maple, American Beech and Red Oak with some others like Sycamore Maple, American Linden, Elm, Crabapple, White Birch, White Pine, Norway Spruce and Pitch Pine. Understory consists of Wild Rose, Winged Euonymous, Barberry, Yew and Staghorn Sumac. Some ground covers and perennials were found including Lily of the Valley, False Lily of the Valley, Fall Aster, Periwinkle and English Ivy.

This aspect of the site was not discussed in the cultural landscape report. In the earliest views of the monument [particularly the 1882 O. H. Bailey sketch as well as photographs from the 1880s through about 1920], the woodlands do not appear to exist or are in very early stages of development. Given the age of the trees in wooded areas, it is apparent that few if any were there during the Depression, approximately 40 years after completion of construction of the monument. It is quite possible that land was used for grazing at that time. Woods in the south to southwest area of the site are 30 to 40 years old and made up mostly of invasive species [Black Cherry, Black Locust and Norway Maple]. The quality of the woods improves slightly in the southwest to west area of the site and is more mature in the west to north where the oldest trees are 50 to 75 years old, mostly Oak. The quality and age of the woods declines in the north to east area of the site. It is apparent that the woods have not been maintained as there are standing dead trees and dead limbs. In addition to Black Cherry, Black Locust and Norway Maple, other invasive species found include a significant amount of low growing and dense Bull Brier, as well as Poison Ivy, Virginia Creeper, Bittersweet, Euonymous [climbing vine] and Japanese Knotweed [near a dump site south of the monument].

This site is not included in the Natural Heritage and Endangered Species Program. No wetland plants were observed in an isolated depression with no outlet in the northwest area of the site.

Recommendations

Although the wooded areas do not appear to be part of the historic image of this part of the site, it could be considered appropriate today as it provides a good background for the monument. Removal of the woods would not substantially improve visibility of the monument from off site except in one instance as discussed below under views. Therefore, the initiation of sustainable forestry practices to maintaining a healthy forest as a backdrop for the monument is very desirable.

Commence a hazard tree mitigation program by removing volatile fuels [decayed matter on forest floor and underbrush] and public safety hazards [standing dead trees and dead limbs]. Remove the invasive volunteer growth. Many are weak wooded trees and they present a public safety hazard. Although difficult to eradicate, the invasive understory of Brier should also be removed. On steep slopes, clear and grub, then install desirable plants to control erosion. The use of appropriate seedlings is a cost effective way to reinvigorate wooded areas. Removal of invasive vegetation [brier, poison ivy, etc.] could be considered an appropriate volunteer project.

Bull Brier, invasive volunteer growth

Wildlife Habitat

Assessment

Existing wildlife is as would be expected in a small semiurban site, with a variety of small birds and mammals.

Recommendations

No changes are recommended.

Scenic Resources

Views

Assessment

The east view to the ocean from the monument is the primary and most important outward looking view. It is considered a character defining feature as it is an integral part of the site design of the monument and was likely part of the reason why this site was selected for the monument. It signifies the importance to the forefathers of the arrival by sea to the New World. The figurehead statue, Faith, gazes in that direction. Visitors had been able to enjoy the view and make the symbolic connection between the monument and the Pilgrims it honors. The view to Plymouth Bay, Saquish Neck, Plymouth Beach and Plymouth Harbor over the northern part of the site of Monument House on the east side of Allerton Street is now obscured by less than a dozen trees that appear to be on site of the house based on the location of the chain link fence which likely defines the boundary of the town owned property beyond. The eventual loss of this view will represent a significant loss to visitors and to the integrity of the site. When the Pilgrim Society owned the house was it was relatively easy to maintain these views.

The monument is not visible from the town center despite its proximity. However, there are several existing and potential views to the monument from outside the property. The first view for many visitors is from Samoset Street after exiting from Route 3 and soon after passing Royal Street where one can see the upper half of the monument over buildings and forest. A potential view exists from Allerton Street after the turn towards the site from Court Street where there is a sign directing visitors to the site. Woodlands and the Juniper edge along the circular drive around the monument obscure this view. Other potential views exist from Standish Avenue. Woodlands obscure the view from the northwest while topography and woodlands obscure the view from the southwest.

Views to the monument from inside the property are discussed under vegetation.

Recommendations

The view toward Plymouth Bay can be restored only with the cooperation of the property owner whose trees interrupt the sight line. Because the view is so important to the design of the monument and the experience of visitors, the property owner should be contacted to see if they would be willing to have selected trees removed and replaced with lower growing trees. Replacements should be dense replacement for wind buffer and have an approximate 30′ maximum height.

Not much can be done to improve the first view from Samoset Street for many visitors. Selective vista clearing is recommended to improve views to the monument from Allerton Street after the turn from Court Street. Attempts to improve the view from the southwest from Standish Avenue may not be worthwhile because of the topography. Little benefit will be gained from attempts to improve views from route 3 and views from the northwest from Standish Avenue .

Visual Quality

Assessment

The maintained areas of the site are generally supportive of the monument except for the plantings introduced in the mid 1960's. While they are attractive, they also undermine the historic appearance of the site. The garage has a very prominent visual position in relation to its importance to the purpose of the site. It detracts from the entrance view of the monument.

While much of the developed area of the site is clean and open, wooded areas on the site have apparently not been maintained in many years. The forest floor is littered with trash and debris on north, south and west sides. Tires, a baby carriage, household furnishings, crushed stone, debris piles, wood pallets and firewood were found as well as dead trees and trees with significant amounts of dead wood.

Recommendations

New facilities should be placed outside the circular drive and screened from view with vegetation. Clean up wooded areas removing trash, debris and dead trees. Prune to remove hazardous dead wood.

Significant/Unique Features

The primary significant feature on the site is the monument. Refer to the following discussion on cultural resources for an assessment and recommendations.

Trash and debris in the woods

Cultural Resources
National Monument to the Forefathers
Assessment
The 81' high National Monument to the Forefathers consists of a 45' high granite octagonal pedestal surmounted by a 36' high statue of Faith, depicted as a classically robed woman with her foot upon Plymouth Rock, a Bible in her left hand and her right hand pointing upward. Four seated granite figures, each approximately 15' tall, are located on pedestals projecting from the base, and represent morality, law, education and liberty. The marble bas-reliefs located below the seated figures depict the departure of the Pilgrims from Delft Haven, the signing of the Mayflower compact, the landing on Plymouth Rock and the first treaty with the American Indians.

Faith Figure and Main Pedestal
Not withstanding the need for repairs, the condition of the Faith figure is good overall. Some moldings of the pedestal show some outward movement. Three areas of damage are noted in the main pedestal. Above the Law statue, in the two courses below the course in which the word "Faith" is inscribed, the lowest molded course has a spall and is displaced outward, and the lowest molding in the course above has two spalls. The nature of the defects suggests that vandalism is the cause. At the lower set of moldings above Liberty the lowest molding has become displaced outward and has lost a section of the upper molding. Another molded stone is cracked at the courses under the subsidiary statues to the left of Liberty.

Stains are most severe in the stone course directly below the book. The white/gray exudation stains are indicative of cementitous materials being washed from the joints. Relatively modest rust stains currently appear in the same joint. Other rust and exudation is apparent to the left of the "Passengers of the Mayflower Panel". There is also some organic growth [blackened pits] in the tool marks of the stone.

Virtually all of the mortar joints are currently defective in the blocks forming the Faith figure. Many have hairline cracks while others are cross cracked or deeply void. Moss and, in some cases, small woody plants, are noted growing from joints, mostly at the pedestal.

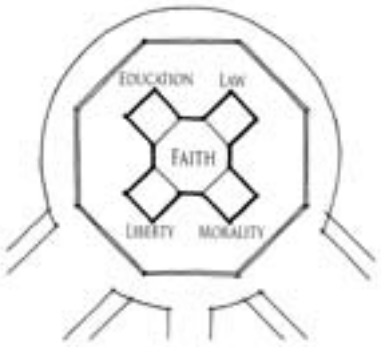


Diagram of monument primary and secondary figures

Secondary Figures and Pedestals

Liberty. The undercut sections of the chain in Liberty's left hand have been broken off. Otherwise the monolithic carving is in good condition, save for the need to fill the joints in the base stone and the gap between the back of the "chair" and the main pedestal [a condition typical of each of the four secondary figures].

Morality. The Morality figure is in good condition and does not require immediate repair. A small crack is noted in the molding below the chair on the right side of the base.

Law. This monolithic carving is also in good condition with the exception that four fingers of the right hand have been broken off, presumably by vandals. Two of these are believed to be in storage. Some of these were missing prior to the 1986 repairs, but these were remodeled and installed with pins and epoxy under that project. Under the Law figure these is a small dutchman in the course under "Justice" on the left side of the chair. This appears stable and the only work required is repointing between this partial stone and the adjoining one. The small molding section in the inscription course, on the right side, is displaced.

Education: This monolithic carving is in good condition and has no specific defects in its base.

Detail of lost fingers at the figure Law

Marble Bas-Reliefs

Marble bas-relief

Each of the white marble plaques is approximately 80″ long by 41″ high and is set in a recess in the stone base directly under the molded base course of one of the secondary statues. The bas-reliefs are surrounded by copper frames that are set on wood subframes fitted into the recess in the each pedestal base provided to accommodate the carved plaque. Each frame has a copper title block onto which the name of the plaque has been raised. Just above the name plate on the horizontal surface of the copper frame there is a recess to accept a latch. The nature of the hardware suggests that these frames may be from the turn of the century, and they appear to have been designed to accept some sort of moveable cover over the plaque. In 1986 plywood panels covered the plaques during the winter. No coverings have been installed in recent winters. Wind, wind driven rain and salt are the primary agencies causing deterioration of the marble. Covering the plaques will help slow these mechanisms of stone deterioration.

Landing at Plymouth [under Liberty]: This sculpture shows erosion at the most projecting surfaces, particularly the facial features. This type of weathering away of the crystals at the stone surface is referred to as sugaring which results in a roughened surface and loss of detail. The sugaring is most severe where the work is least shielded from wind, rain and salt spray. The edges and recessed areas are in better condition than the central area and projecting features. This tablet shows limited salt accumulation on the surface and has only limited fine cracks in the stone surface and has little surface soiling.

Embarkation from Delft Haven [Morality]: In poor condition, this tablet has many large, long cracks and is more soiled than "Landing". The additional soil accumulation appears to relate to the location and the direction of wind and rain. Generally dark soiling on carbonate stones is the result of dirt layers trapped in gypsum salts that form on the surface in areas not regularly washed by rain [but adjoining them]. These long cracks are the result of weathering of veins running generally horizontally across the stone. At the right side of the tablet just above the center at the top of the stone wall carving, there is a spalled area of stone. Cracks are noted through the lower flat surface. Long cracks include ones that run through the boat and ramp and across the feet of the figures, as well as line of cracks through waists and elbows and through the wall. This plaque has some existing fills at a crack at the upper right that has a soft fill that can readily be removed. There is an old granite dutchman directly under the tablet's frame. Sound, it may be original.

Treaty with Massasoit [Law]: This tablet also requires extensive conservation. The plaque has serious deep cracks particularly at the left side near the bottom. There is a deep crack extending from the bottom up through the arm of the leftmost seated Indian figure. There is substantial loss, possibly due to vandalism along the carved border detail from near center to the right edge at the top.

Signing of the Social Compact [Education]: This tablet exhibits general erosion and sugaring of the projecting features and more significant weathering loss at the knee and foot of the figure to the right of the table. The forward leg of the chair under this figure is missing, most probably due to vandalism of the freestanding [undercut] feature. The extent of cracking along veins in the stone is less than on other plaques.

Recommendations

The following is a summary of recommendations from the 2003 conditions assessment. Since more than a year elapsed with no work undertaken, the Designer responsible for the construction phase of the work should inspect all items from grade, with binoculars, to verify the work items, and modify the treatments based on those observations before work is begun.

Faith Figure and Main Pedestal

The Faith figure, and the Monument as a whole, should undergo general masonry cleaning to remove soiling and specific stains. All of the mortar joints should be cut out and repointed. Consider repointing with one of the stronger formulations of hydraulic lime that might provide the flexibility and self healing properties, and could result in greater longevity of the repointing work. At the limited locations where lead bedding prevents cutting out the joints properly, the joint should be filled with a flexible sealant colored to match the mortar and dusted with mortar sand to blend the appearance. While the old repairs are sound and should remain, the following repairs should be made at this time. Above the Law statue, in the two courses below the course in which the word "Faith" is inscribed, remove and reset the lower molding using noncorrosive anchors set in epoxy. Embed the dutchman in epoxy. A lower priority is to cut out the full length of the damage to stone above, and at the molded stone and to provide a dutchman repair to restore the detail in each location. At the lower set of moldings above Liberty the lowest molding has become displaced outward and has lost a section of the upper molding. Remove and reset the lower stone. As a lower priority, provide a dutchman set in epoxy to restore the profiles of the molding in the upper stone. Another molded stone is cracked at the courses under the subsidiary statues to the left of Liberty. Cut out and replace a regularly shaped section of the damaged stone extending at least 2" beyond the damage with a tightly fitted dutchman set into the backup with noncorrosive pins and epoxy around the perimeter of the dutchman.

Secondary Figures and Pedestals

For each, provide cleaning and repointing as recommended for Faith. Backfill the horizontal joint behind the chair with mortar, holding back the mortar to allow installation of a protective lead weather cap bedded in sealant. An appropriately sized ready made "L" shaped cap may be used. Liberty and Education require no further work.

Morality: Stabilize the cracked moldings at the inside corner by injecting the cracks with an acrylic based adhesive.

Law: Remove and reset the displaced molding on the right side of the inscription course. Reset using threaded stainless steel pins set into epoxy and epoxy bed [not a mortar joint] the small molding section to the mother [larger, original] stone. Two of the fingers have been salvaged and stored. The remainder will have to be sculpted, first in clay, and later in matching granite after the model is accepted. The reset fingers should have threaded stainless steel dowels embedded into the fingers with grouting epoxy and the dowels should project out 3" for embedment into the hand with epoxy. An thickened epoxy adhesive should fill the joint between the new piece and the mother sculpture

Marble Bas-Reliefs

Provide and install ventilated clear covers over the marble bas-reliefs on a year round basis. New wood subframes are required, but it may be possible to rehabilitate the existing copper frames, although when the final design of the panel is established it may be determined that the old frames are too light weight to support the panels. The old title blocks should be retained and refixed to the new or rehabilitated frames. The green patina should be retained on the copper elements that are reused and new copper sections should be permitted to weather naturally. A vandal-proof Lexan panel should be provided to fit into the frame, perhaps also framed in copper to form a "sash". Nonobtrusive screened vents through the Lexan should be designed to allow air circulation behind the panel.

Each bas-relief stone surface should be gently poulticed clean to remove soil [gypsum based] and salts by a trained art conservator regularly involved in the conservation of marble sculpture. Other specific recommendations for each include:

Landing at Plymouth [under Liberty]: Fill fine cracks and larger voids. Restoration of weathered, blurred or lost detail is not recommended.

Embarkation from Delft Haven [Morality]: Stabilize and fill cracks.

Treaty with Massasoit [Law]: Stabilize and fill cracks. Restoration of damaged detail is not recommended.

Signing of the Social Compact [Education]: Stabilize and fill cracks. Restore the missing chair leg.

Detail of erosion at bas-relief

Stone Site Features

Assessment

There are a number of manmade stone site features on the grounds of the National Monument to the Forefathers. Many of them are integral to the overall character of the site.

Granite Posts: The vehicular entrance at Allerton Street is framed by 2 granite ashlar posts that date from 1896-1897. Each is approximately 10′ tall and is made up of a granite base, 7 courses of ashlar stones and a pyramidal top, dressed along the edges, but rusticated elsewhere. The 2003 condition report notes that these posts are "in poor condition, the joints are all either void or cracked and some of the base stones show outward displacement". The granite posts at the vehicular entrance date from the site's period of significance, have not been altered and, despite their poor condition, retain a high level of historic integrity.

Granite Shells: There are 4 granite shells located to each side of the 2 pedestrian paths, at their intersection with the circular drive. Each 2.5′ high shell is carved out of a single piece of granite and is in good condition. Research indicates that these were salvaged from the canopy that Billings designed for Plymouth Rock, which was demolished to make way for the 1921 portico designed by McKim, Mead and White. While it is not known exactly when they were placed at the site, the earliest photograph located that shows the shells date from the mid-20th century. Although not original to the site, the granite shells have a strong association with the monument's designer.

Granite Bollards: Two square granite bollards with pyramidal tops are located at the foot of the path toward Liberty. Carved out of a single stone, they are approximately 3′ tall and in good condition. The tops and edges are dressed, while the face of each side is rusticated. The origin and date of the bollards is not known. Like the shells, it is speculated that they may have been salvaged from the Plymouth Rock canopy. Photographic evidence indicates that they were placed on site sometime between 1920 and ca.1935-40.

In addition, 2 granite quarter round bollards are located at the foot of the sidewalks on each side of the vehicular entrance. They are approximately 2.5′ tall, with a rough, rectangular base and a dressed, quarter round top. They are in good condition. Research indicates that historically there were 4 of them, located at the corners where the paths toward Liberty and Morality met the circular drive. They appear in photographs from the 1890s through around 1920. In these locations, the rough, lower half of the stone was below grade. It is not known what happened to the other 2 bollards. The granite quarter round bollards date from the site's period of significance.

Granite Platforms: Two granite platforms are located north and south of the monument, just beyond the existing paved circular area at the base of the monument. The platforms would have been inside the paved area before the area was reduced in size. Roughly 5.5′ by 6.5′ and each with a small step, the platforms have attachment holes which research suggests were used for viewscopes in the mid-20th century. The steps are made of a different granite than the platforms, suggesting that they may have been added at a later date. The granite platforms are no longer functional as viewscope platforms and do not contribute to the historic character of the landscape.

Concrete Post: A single, 3' tall concrete post on an octagonal, concrete base is located near the granite platform north of the monument at the end of the former path to Morality. There is also a metal sleeve in the lawn at the end of the path to Liberty that may have once had a similar function, perhaps holding a sign. Like the granite slabs, it is not a character defining feature.

Cut Granite Pieces: A number of cut granite stones have been placed on the site: 2 near the vehicular entry to limit access and 14 of various shapes and sizes outside the circular drive near the top of the embankment, mostly on the southwestern edge. While the origin of these stones is not known, they exhibit early nineteenth century tool marks and appear to be salvaged building stones. It has been speculated that they may be from the original Plymouth rock canopy. It is also not known when they were placed on site. These stones may possess historic significance, although their association with the Forefathers' Monument is unclear. Additional investigation is required to determine the origin and significance of these stones.

Granite Marker: Dated 1884, a granite marker has been placed near the restroom facility. It reads "On this hill the Pilgrims who died the first winter were buried. This tablet marks the spot where lies the body of one found October 8, 1883. The body of another found on the 27th of the following month lies 3 feet northwest of the westerly corner of this stone. Erected 1884". This marker was reportedly salvaged from Coles Hill, near Plymouth Rock.

Recommendations

Granite Posts: These posts should be cleaned of organic material [not compete restoration cleaning] and joints should be cut out and repointed using a hydraulic lime mortar. If feasible the displaced base stones should be restored to their original position. While the condition of the posts is not sufficiently poor to require fully rebuilding the posts, it may not be possible to reset displaced stones without disassembly of the entire post, because of the weight of the stones above.

Granite Shells and Bollards: These elements are in good condition and should be maintained in their current locations.

Granite Platforms and Concrete Post: These elements should be removed if an appropriate new function is not identified.

Cut Granite Pieces: These stones should be studied further to determine their age and origin. This information will help determine an appropriate treatment for them.

Granite Marker: More research should be provided to determine the origin of this marker to help determine an appropriate treatment for it. In the meantime, it should be placed in storage, off site, so as not to confuse visitors and to insure its protection.

Granite shells and bollards

Fence

Assessment

The iron fence that runs along Allerton Street was installed around 1896-1897. The fence has monolithic granite end posts and iron intermediate posts. Other than some paint spatters, the end posts are clean and undamaged. The intermediate cast iron support posts, resting on granite bases, are also generally in very good condition. Sedimentation has buried a number of the granite bases, including some of the bottoms of the iron posts. This is evident for a portion of the north end and for more significant length at the south end. A few posts are not plumb, although very few appear bent. In one case the post is displaced at its base and one iron post had a crack through the base. Some new iron rails have been provided to replace missing sections. The rails and the couplings are reasonable matches to the originals. The original rail sections are beginning to show rust formation in pits in the metal. The original metal rail couplings have the inscription "Kee Klan 14-8 England". The fence, which dates from the site's period of significance, is a character defining feature. Its prominent location along Allerton Street, flanking both the vehicular and pedestrian entrances to the site, contributes to its significance. With a good percentage of original materials, the fence retains a high level of integrity.

Recommendations

Maintain the fence. Schedule repainting of the railing in 2 to 3 years. Blast the rail to white metal and provide an aliphatic urethane primer and epoxy top coat. Reposition the iron posts that are not plumb. Repair cracked iron post bases with an epoxy adhesive. Reattach iron posts no longer fastened to base stones. Strip back the sediment covering the tops of granite bases to expose them. Reset bases that have settled to proper grade and alignment.

Iron fence along Allerton Street

Recreational Resources
Visitation and Access
Vehicular Circulation System

Assessment

The National Monument to the Forefathers has a simple circulation system that has not changed significantly since it was established around 1897. Vehicles enter the site at the southeast corner of the property via an approximately 25′ wide approach from Allerton Street. The approach connects to a circular drive. A fork in the approach creates a triangular island that is mostly lawn. A small patch of asphalt has been recently removed in the island, likely marking the former location of the gift shop/bookstore. The lawn in that area has not been restored yet. Near the main entry at Allerton Street, the surface of the approach is finished with approximately 60 courses of 4″ x 12″ asphalt pavers. The remainder was finished in asphalt that was in poor condition and hazardous to pedestrians. The asphalt was recently removed and replaced with gravel, the historic surface. Some erosion and sedimentation is evident on the gravel drive near the entrance on the north side where grades steepen. The pavers may have been salvaged from the path leading to Morality, which was removed sometime before 1965. Remnants of cobblestones are visible along the outer edge of the approach, possibly indicating a former drainage channel. The near edge of the approximately 30′ wide circular drive is located about 180′ from the center of the monument. An asphalt driveway leads to the garage and restroom facility located to the southeast of the monument. It is not known when this drive was constructed, although it does not appear on a 1965 planting plan. The asphalt is in good condition.

Granite steps on the path to the Dedication Panel

While contemplated early in the development of the site, Monument Avenue [now the east-west portion of Allerton Street] was not extended along north edge of the site. This extension of Monument Avenue was shown on an 1879 plan and later on a 1903 plan. Topographic implications are a likely reason this work was not done. The drive would have been much too low in relation to the monument to benefit the site, not facilitating physical or visual access to the monument.

There is no designated parking on the site. Vehicles currently park in front of the garage and along the circular drive on both the inside and outside edges.

Recommendations

The circulation system at the National Monument to the Forefathers retains a high level of integrity. Portions of the system require prompt attention. The maintenance requirements of dealing with erosion, dust and dirt of the current gravel surface is significant. While this is a historically appropriate material, it is be beyond the capacity of staff to provide adequate maintenance. The resin mix used at Plymouth Rock is not strong enough for vehicular use. A chip seal surface with the color of gravel is an acceptable alternative from a historic appearance perspective. Maintenance requirements will be less with such a surface and because the site is not plowed of snow in winter, it should not require annual patching. The pavement should extend beyond the vehicular gates to meet Allerton Street and the existing asphalt block pavers should be salvaged and stockpiled for replacements or for use in new work like reconstruction of the path to Morality. The asphalt drive to the garage and restroom facility should be replaced with an appropriate material when work is preformed in conjunction with those facilities.

When the asphalt pavement was removed from drive surfaces, the finish grade of the drive was left lower than adjacent lawn surfaces, creating concentrated flows of water in some areas and resulting in erosion. When the drive is resurfaced, care should be taken to avoid concentrated flows of overland water.

Given the topography of the area, the once contemplated extension of Monument Avenue along the north edge of the site would not appear to benefit the site and there appears to be no benefit to pursuing the extension.

A small number of designated parking spaces would be desirable once a new multipurpose building is provided as discussed under buildings.

Pedestrian Circulation System

Assessment

The circulation system at the Forefathers' Monument has experienced a modest number of alterations, including the removal of one pedestrian path, the reduction in size of the circular area at the base of the monument, the addition of a driveway and the replacement of some surface materials. Overall, however, the circulation system retains its historic configuration and many historic finishes remain intact. It is a character defining feature from the site's period of significance and has a high degree of integrity.

Sidewalks: The approach drive has 4.5' wide concrete sidewalks in good condition that run along each side of it and terminate at the circular drive. The sidewalks are not visible in photographs from 1897, but do appear on a 1929 site plan. Their historic material is not known.

Path to Liberty: A pedestrian path leading from the circular drive to the base of the monument at the figure of Liberty has been altered somewhat from its historic appearance. When constructed around 1897, the path was approximately 24' wide, finished with gravel and edged with several courses of asphalt pavers. Currently, the center area is grassed and the asphalt pavers, though still present and partially visible, have become overgrown with turf, narrowing the apparent overall width of the path. 4' wide concrete walks, constructed by the mid-20th century, now mark the edges of the path. Two granite bollards and two carved granite shells are located at the foot of the path. The concrete walks are in good condition.

Path to Liberty

Path to Dedication Panel: Beginning at Allerton Street, this path leads directly to the dedication panel. The existing path has concrete steps flanked by granite fence posts at Allerton Street. The concrete steps are uneven and unsafe. The lowest step has been displaced outward toward the street, creating a significant tripping hazard. An 8′ wide concrete walk, in fair condition with several patches, leads to 8 granite steps flanked by granite cheek walls and posts where the path meets the circular drive. The steps have also become displaced, creating a tripping hazard, and the uppermost tread is broken. An approximately 12′ wide by 110′ long path continues between the circular drive and the base of the monument, where it is finished with a field of hexagonal asphalt pavers [approximately 8″ across] and edged with four courses of 4″ x 12″ rectangular asphalt pavers. Research indicates that these exposed aggregate finish pavers were installed around 1897. The path was restored in the fall of 2003, when the pavers were removed, the path regraded and all salvageable historic pavers, along with some replacement pavers, were installed on a new subbase. Through this project, about 10-15% of the historic hexagonal pavers were replaced in kind. The path is currently in excellent condition. A granite threshold placed where path intersects the circular drive had been carefully profiled to match the profile of the path. When the edge pavers were reset along the edges of the path, they were not set in the proper profile to create a gutter at the edge of the path as suggested by the granite threshold.

Path to Dedication Panel

Path to Morality: Research indicates that another path, matching the one leading to Liberty in design and materials, once led to the figure of Morality. The path was removed sometime between 1929 and 1965. At that time the salvaged asphalt pavers may have been moved to the main entry.

Path at Base of Monument: Both of the existing pedestrian paths terminate near the base of the monument. Immediately around the base, an octagonal area, approximately 63′ across, is finished in concrete paving within granite curbing. Research indicates that this area was historically finished with a variety of materials, including grass and tiles in the 1890s and a granolithic material beginning in 1900. The granite curb is likely original. The existing concrete was installed in 1987 and exhibits minor cracking and a few spalls where the concrete meets the curb. Most of the sealant joints have become unbonded. No expansion joint was provided at the base of the monument.

Path at base of monument

Outside of the granite curbing, is a circular asphalt paved area that is in good condition. Research indicates that this area was historically gravel and significantly larger in diameter, until some time in the mid-1960s. This is reflected today in the change of materials at the pedestrian paths that had to be lengthened to meet the smaller diameter area. About 30′ of the end of each path was finished with asphalt to make up the difference.

Recommendations

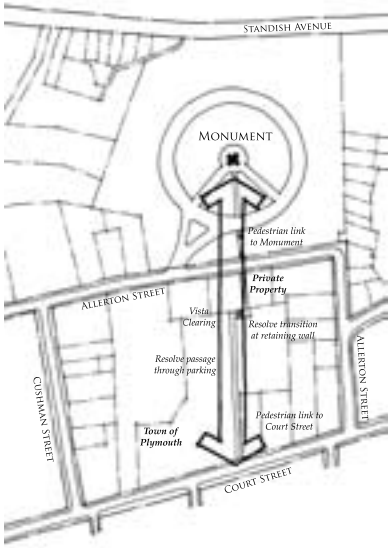
Sidewalks: The concrete sidewalks along the approach drive are in good condition. Weeds growing in the cracks should be removed on a regular basis.

Path to Liberty: The pedestrian path leading to the statue of Liberty should be restored. The concrete sidewalks should be removed and the historic asphalt pavers, now overgrown with turf, should be exposed, assessed, removed and reset. Missing or broken pavers should be replaced in kind as needed. The lawn center of the path should be replaced with chip seal to facilitate access and be compatible with the historic appearance of gravel. The surface is too steep for gravel without a high level of maintenance because of the erosive probability of a gravel surface.

Path to Dedication Panel: Reset the lower concrete step where the path meets Allerton Street. Remove and rebuild the granite steps and cheek walls above. Repair the broken step by providing threaded stainless steel rods set in epoxy across the crack, and use epoxy adhesive to bond the sections. Replace the foundation as required. These stairs have no railings, which may be required if they are reconstructed. The pedestrian path leading to the dedication panel was restored in the fall of 2003 and is in excellent condition. It should be monitored and any pavers that become badly cracked, broken or missing should be replaced in kind. Consider an east-west extension of this path across Allerton Street to Court Street as suggested to some degree in the 1897 Bailey sketch to create a more direct pedestrian connection to Court Street and downtown. The path extension to Court Street could assist with and become part of the "Pilgrim Path" walking tour concept that was conceived some years ago.

1897 Bailey sketch of the monument and surroundings

Diagrammatic plan of potential path extension to Court Street



Path to Morality: The pedestrian path leading to the statue of Morality, should be reconstructed to match that leading to Liberty in design and materials as it once did. This requires the installation of new asphalt pavers that replicate the original units or reuse of the salvaged pavers from the entrance drive. The reconstruction of this path would recreate the symmetrical path design that was in place from ca. 1897 into the 1900s. It would also work well with the recommended vista clearing in the area discussed under views.

Path at Base of Monument: The concrete area above the raised granite curb should be restored to lawn as it was historically. The asphalt area should be made a chip seal surface to restore the appearance of the historic gravel surface. Some indication of the original diameter of the paved pedestrian area around the base of the monument should be provided and the awkward transition of materials at the pedestrian paths should be eliminated. This can be accomplished by providing a stone circular marker at the outer diameter of the original paved circle and extending the chip seal surface to that point. The alternative of extending the paved area to the original diameter is not recommended at this time because current use does not appear to warrant the expansion. If it is observed that use requires additional paved surface in this location, the diameter of the paved circle should be expanded to its original dimension.

Curbing

Assessment

There are two types of curbing on the site: granite near the base of the monument and precast concrete along two portions of the outer edge of the circular drive. The granite curbing delineates an octagonal area at the base of the monument and was installed sometime prior to 1896. Each side of the octagon has three 9′ lengths of granite with a roughly quarter round profile. Although generally in very good condition, some sections of the curbing were damaged during the installation of the concrete paving in 1987. Careless cutting of the control joints in the concrete during installation resulted in several cuts into the granite curb. The granite curbing dates from the resource's period of significance. It is a character defining feature and retains a high level of integrity.

The two sections of concrete curbing along the circular drive, to the north and south of the monument, have a rectangular profile. The curb is located only where steep banks come in close proximity to the drive, presumably for public safety. The curb collects and directs storm water to drainage outlets that act as point source discharges, contributing to erosion of the bank below. Although in good condition, the concrete curbing is a modern addition that neither contributes to nor detracts from the historic character of the site.

Recommendations

The granite curb is in good condition and should be maintained except as noted under universal accessibility. Because of the erosion damage being created, the concrete curbing should be removed and replaced with an appropriate barrier rail that will provide a higher degree of public safety.

Universal Accessibility

Assessment

There are no designated universally accessible parking spaces on the site. The main feature of the site, the monument, is not universally accessible because paths leading to the monument are currently too steep. The two paths have average slopes of about 10%.

Recommendations

Provide designated universally accessible parking spaces. Several alternatives were considered to make the monument universally accessible. The preferred solution is to provide a separate new walk from southeast side of monument across to back side. With gentle recontouring of the land to accommodate a 5% maximum gradient, this path should be virtually invisible from the entrance to the site and thus create the least visual disturbance of the historic image. Other alternatives that were considered and discarded for a variety of reasons included: regrading one of more of the paths between the circular drive and monument to provide 1:12 ramps with handrails and landings; providing a drive access to back side of monument; raising the level of the circular drive approximately 4' to allow for 5% maximum walks from the drive to the monument; and provide sufficient interpretive material at the edge of the circular drive to make the trip to the base of the monument unnecessary.

Recreational Demand and Current Uses

Assessment

With the Monument on the same tour schedule as Plymouth Rock, bus traffic and visitation is very high. It has been estimated that approximately 250,000 people visit this site each year based on information extrapolated from other visitation data. Tour buses and school groups come to the site and drive around the monument. Some stop and allow people to get out and walk around the monument. This type of activity is greatest from early May through Thanksgiving. Aside from tour buses, it is very common to see a few people on site examining the monument or walking their dogs.

Recommendations

The site has sufficient capacity for the current volumes and types of use. It is likely that it could accommodate greater volume and some other types of passive recreation like picnicking. Once the site has staff assisting with interpretive programming, it would also be possible to monitor volumes, durations, times, types and impacts of use. With that data, staffing, and interpretive and other programs can be adjusted to more accurately accommodate demand.

Activities/Programs

Assessment

Other than the current activities noted above, there are no specific staff or programs provided for or related to the site.

Recommendations

The public profile of the property should be enhanced with increased programs and visibility. This requires staffing for interpretive programs, new programs, advertising of programs, joint programs with other entities in Plymouth, an improved sign system directing people to the park, and improved pedestrian connections to the park from downtown.

While the site should remain focused on providing a passive recreation experience, providing interpretive programs and facilities is highly desirable. In addition, some of the scheduled activities and events that currently occur at Plymouth Rock, like summer evening concerts, summer festivals, etc., may be more appropriate at this site which has a much larger area. This would create a higher visitation level and expand the hours of use.

To facilitate accommodation of these events, it should be noted that there is a limited amount of parking space available downtown, which is a good walk away. On this site there is currently space for parking about 50 vehicles along the outer perimeter of the circular drive. Space for another 30 vehicles could easily be added in the area near the garage. There is also a large parking area on town land just north of the site accessed from Court Street.

Interpretive Resources

Assessment

This site lacks interpretive resources. There are no signs, other materials or programming on site that conveys historic significance.

Recommendations

Provide signs and/or handouts to expand the identification and interpretation of the historic and other components of the park. Develop interpretive programs that are appropriate to the site, but do not overlap or repeat interpretive themes or content provided at other nearby historic sites in Plymouth. It seems appropriate to focus on issues relevant to the monument and not dwell on the Pilgrims per se as they are well covered at other sites in the area. The interpretive program should be unique to the site and could focus on Billings, the conception, imagery and implementation of monument, stone and conservation work. The program could also provide a thematic link between this site and other DCR properties in southeastern Massachusetts, like Borderland State Park, which shares with the National Monument to the Forefathers an association with the Ames family. The means of conveyance of interpretive information should be reviewed with the DCR Chief of Interpretive Services.

Facilities
Buildings
Assessment
There are two buildings on the site, a garage and a restroom facility, both southeast of the monument. Neither are historic structures and neither was shown on a 1965 plan, but a booth [gift shop/bookstore], now removed, was shown.

Existing Garage

The garage was built as a gift shop, probably in the late 1960s, and modernized as an equipment storage facility by the Department of Conservation and Recreation around 2001. This is the only building on the three sites maintained by this staff [the National Monument to the Forefathers, Plymouth Rock and the Myles Standish Monument in Duxbury]. Since it began serving as a place for equipment storage, staff travel time has reduced significantly. In good condition, it is a one story, one bay, concrete block building sided with wood clapboards and topped by a front gable, asphalt shingled roof. The facade has been damaged on southwest corner. This building has insufficient size for anticipated equipment storage needs.

Existing Rest Rooms

The one story, flat roof, concrete block restroom facility, which likely dates from the same period as the garage, is located south of the garage and partially screened by a hedge. It is in poor condition and inoperable although there are water and sewer connections to the town system. No public services are provided by these buildings in their current state.

These structures do not relate to the resource's period of significance or contribute to the landscape's historic character. The garage does however serve contemporary park needs. The restroom facility could, if it were operational.

Recommendations
Both functions should be maintained. However, they should be replaced with a new multipurpose facility that accommodates all of the needs of the park and meets the requirements of the anticipated desired user population and user activities. It is unlikely that the needed equipment would fit into the current maintenance building and a new larger facility would be beneficial for equipment storage, staff space and interpretive components. Water and sewer connections to the town system should be maintained because there is a sewer connection moratorium in the town at this time and a Clivus system does not seem appropriate for this site. With anticipated increased staff time on site, sanitary facilities would be highly desirable for staff, and for visitors as well. The style of the new building should be compatible with the historic nature of the site.

Site Amenities

Assessment

Signs: Signs directing people to the site are weak [few and not easily detected] and no signs provide information about the park or its contents. A wood park identification sign that reads "National Monument to the Forefathers, Pilgrim Memorial State Park, Department of Conservation and Recreation" is located on the south side of the approach, not far from the main vehicular entry. Assumed to be a recent addition, the sign is in excellent condition. On the north and south sides of the entry drive are sign posts, each with 2 regulatory metal signs. The upper signs read "No ball playing or bike riding" and the lower signs state "All dogs must be leashed". There are also two informational signs related to the donation box. A metal sign behind and above it states "The Conservation Trust. Your donation here to the Conservation Trust will be used to improve this park's programs and facilities. Thanks for making your park a better park." A sign with a similar message is adhered to the face of the donation box.

Park identification sign

Flagpole: A contemporary painted steel flagpole with wood supports is located in the triangular island created by the fork in the approach drive. Not shown on the 1965 plan, the flagpole is in fair condition with peeling white paint.

Donation Box: Next to the flagpole is a metal donation box [also known as an "iron ranger"] that is in excellent condition. This is also not shown on the 1965 plan.

Informational signs

Picnic Table: One wood table in reasonably good condition is located near the garage.

Benches: There are no benches currently on the site. Historic photographs indicate that both wood [1903] and granite [1973] benches were located near the monument at various points in time.

Trash Receptacles: There are no trash receptacles currently on the site nor is there evidence that there ever were any.

Drinking Fountains: There are no drinking fountains currently on the site nor is there evidence that there ever were any.

Granite benches adjacent to monument, 1973 [courtesy of Historic New England]

Wood benches adjacent to monument, 1903 [courtesy of Historic New England]

Recommendations

Signs: Improving the signs directing people to the site and providing interpretive information once on the site is highly desirable to publicize the site, provide better connections and directions to it, give it a better identity and enhance the visitor experience. The park identification sign should be maintained in its current location until the new building is implemented. At that time the location should be reconsidered. Regulatory information should also be provided as part of an overall sign system that is compatible with the historic nature of the site. If the need arises for additional structures on the grounds, like information kiosks and/or wayside signs, they should be sited so that they do not detract from the historic character of the landscape or interrupt views to or from the monument. All new structures/objects should be limited to areas outside the circular drive.

Flagpole: Maintain the flagpole in its current location until the buildings are replaced. At that time replace and relocate the flagpole in closer proximity to the building and outside of a primary view to the monument.

Donation Box: Maintain the donation box in its current location until an interpretive program including interpretive signs is developed. At that time integrate the donation box into the overall signage system.

Picnic Tables: A few picnic tables near the recommended multipurpose building would be appropriate both for staff and visitors. Elsewhere on the site picnic should be encouraged, but without formal facilities.

Benches: Provide granite backless benches near the base of the monument to match the character of the benches that were once there. The earlier wood benches would not be as durable or as compatible a character as granite benches.

Trash Receptacles: Do not provide trash receptacles outside the building.

Drinking Fountains: Do not provide drinking fountains outside the building. If they are deemed desirable, provide them in a publicly accessible location inside the new building.

Site Utilities

Assessment

Storm Drainage: For the most part storm water travels overland to the edges of the site. In two areas it is collected at the concrete curbing at the circular drive and piped to point source discharges, creating severe erosion conditions downslope. There is one corrugated metal pipe outlet on the south side. Two drains on the north side, one on each side of drive, appear to be piped to an outlet on the slope.

Water Supply and Sanitary Sewer: Both are provided to the rest room facility and are tied into the town system. There is no other water supply inside the site. Beyond the limits of the site is one fire hydrant on the far side of Allerton Street near the entrance drive and another on the far side of Standish Avenue.

Electric Supply: Electric service has been brought into the park, but is not currently in the buildings at this time. There is one security light not far from garage. There is no telephone service.

Recommendations

Storm Drainage: Eliminate the need for collection and point source discharges of storm water by removing the concrete curb on the outer edge of the circular drive. This will significantly reduce erosion conditions created by these elements.

Water Supply and Sanitary Sewer: Maintain the water and sewer connections to the buildings until they are replaced with a new building. Tie these services into the new building. Extend the water supply to the area inside the circular drive for irrigation of lawn areas and monument maintenance.

Electric Supply: Extend the electric service to provide electricity to the new building. Extend the service to the monument to facilitate events/concerts. Provide illumination for the monument in the form of flush mounted or low profile theatrical [dramatic] lighting as opposed to general area lighting. This type of illumination should help reduce vandalism of the monument and not significantly impact historic appearance. Should the program for evening concerts be relocated to this site, general area lighting may be desirable for public safety. To alleviate the potential discomfort of park abutters the lighting should be on a timed system such that it turns off around 10 PM. Motion detectors and/or surveillance cameras are not desirable at this site.

Corrugated metal pipe at the concrete curb on the circular drive

Physical Features/Boundaries

Assessment

Perimeter control: There is no pedestrian control, but there is some for vehicles. The Allerton Street edge has vehicular control with a historic iron fence and a standard contemporary DCR steel gate. The gate is locked each evening and opened each morning. The Standish Avenue edge is controlled only by topography. Some dirt paths lead up the slope from Standish Avenue to the monument site. Other edges with residential abutters are generally undefined except for a wood board fence recently installed by DCR along part of the south property line.

Vandalism: The monument is in a neighborhood setting and some abutters watch over the site on an informal basis. However, due to unauthorized off hour use, the monument has been periodically subject to vandalism including physical damage to the monument at the fingers, chain, moldings and projecting features of the bas-reliefs. This has been an ongoing problem. Although repaired and upgraded in 1988, vandals have ripped the lower parts of the down leads of the 1912 lightning protection system away from the attachments, and the cable leading to the ground plates has been broken and disconnected. Graffiti was noted on the rear faces of the monument in 2003. Dumping of debris on site was evident in 2005 as well as ruts from tire tracks in lawn areas on the west side of the monument, in an area concealed from view from the street. The Crabapples contribute to reduction of visibility of this area.

Recommendations

Vehicular control appears adequate, but the standard DCR gate is not compatible with the historic nature of the site. It should eventually be replaced with a more appropriate gate.

Security must be improved to reduce, if not eliminate, vandalism of the monument, graffiti, on site dumping and indiscriminate driving on lawns. Illumination of the monument and a perimeter fence of 6′ high black vinyl clad chain link placed along all remaining unfenced edges would assist with security. Permanent protective covers should be placed over the four bas-reliefs of the monument as previously discussed. Repair lightning protection system for the monument. Develop an "in house" graffiti removal kit and train staff to promptly remove graffiti.

Tire ruts in lawn

View from entrance, 2002

IMPLEMENTATION PLAN

Priorities and Phasing

Priorities were established in conjunction with the Department of Conservation and Recreation. The priorities for this project focus on improvements that will protect historic resources, resolve public safety issues, restore and enhance the prime assets of the park, enhance visitor use, and enhance the park and ease maintenance requirements.

Proposed improvements have been broken down into four priority categories to facilitate planning and budgeting requirements. The actual order of events will depend completely upon sources and availability of funds and the needs and desires of the Department of Conservation and Recreation. Priority categories can be combined or further subdivided as funds are available and as opportunities present themselves.

In projects for historic properties priority setting is a relatively straight forward matter, that is, insure public safety and protect historic resources first. Other issues come to the forefront like the need to maintain deteriorating infrastructure and maintaining an appropriate visual character for visitors. The highest priority items are typically related to issues of public safety, structural stability and protection of historic fabric. These items should be corrected first and as soon as funds allow this work to be accomplished. Medium priority improvements should be corrected next and generally relate to issues of security, preventing accelerated deterioration or damage which could lead to higher future costs, replacement of items which are expected to last less than five years, and repair or replacement of items that significantly detract from the appearance of a historic property. Lower priority improvements include cosmetic repairs and future considerations that can be delayed at least five years.

Cost Estimates

These estimates are presented with the priority categories described above. They should be considered preliminary in nature and used for discussion purposes only. Many items should be considered flexible because of the scale and level of detail development of this plan. Because of the probable long range nature of this project, a factor for inflation has been omitted. Inflation could easily double this estimate in a very short period.

It should be noted that the following costs are for budgeting purposes only. These estimates are in year 2005 dollars and are subject to change. Estimates reflect a public bid process as required by the Department of Conservation and Recreation. Although construction costs were very stable between 1990 and 1995, they increased substantially in recent years, but appear to be beginning to stabilize again. Some of these costs could be reduced with selected services provided by volunteer and/or Department of Conservation and Recreation forces.

Priorities and Capital Cost Estimates

Priority Category One
Resolution of Public Safety Issues
and Monument Protection [Early Action Projects]

Security Lighting	$60,000	
Conservation of Marble Bas-Relief Panels @ Monument	90,000	
Clear Vandal Resistant Covers for Bas-Relief Panels	11,000	
Repair/Reset Steps	14,000	
Public Safety Improvements in Wooded Areas*	15,000	
		$190,000
General Conditions		28,500
Contingency		21,500
Consultant Services		36,000
Total		276,000

Priority Category Two
Restoration and Enhancement of the Prime Assets of the Park

Monument Conservation		
Clean stone, including stain and graffiti removal	28,000	
Cut out and repoint all joints	39,000	
Dutchman repairs to moldings of pedestal	6,000	
Reset loose stones at secondary statues bases and provide weathercap between back of second figure chairs and pedestal	5,000	
Dutchman carving repairs to secondary figures	8,000	
Inject small cracks	5,000	
Repair and recondition lightning protection system	6,000	
	97,000	
Improve Views to Ocean	15,000	
Pave Drives	175,000	
Restore Walks leading to and around Monument	50,000	
Complete Iron Fence Restoration @ Allerton Street	14,000	
Repoint Entrance Posts	3,000	
		354,000
General Conditions		53,000
Contingency		41,000
Consultant Services		67,000
Total		515,000

Priority Category Three
Use Enhancement

Improve Views to Monument*	30,000	
Universal Accessibility Improvements	6,000	
Replace Garage/Restrooms with Multipurpose Building	500,000	
Designated Parking	25,000	
Benches and Picnic Tables	40,000	
Relocate Flagpole and Donation Box	2,000	
Interpretive Elements	100,000	
		703,000
General Conditions		105,500
Contingency		80,500
Consultant Services		133,000
Total		1,022,000

Priority Category Four		
Resource Enhancement		
Replace Curbing with Barrier Rails	9,000	
Erosion Repairs	20,000	
Irrigation System	30,000	
Perimeter Fencing	32,000	
Improve Wooded Areas*	100,000	
Conserve/Relocate remaining Stone Site Features	20,000	
		210,000
General Conditions		31,500
Contingency		24,500
Consultant Services		40,000
Total		307,000
Grand Total		$2,120,000

* Potential Volunteer Project and/or DCR staff Project

Refer to Business Plan for Staffing, Equipment and other costs.

Steep slopes adjacent to circular drive

MAINTENANCE PLAN

The overall goal of this plan is to enhance the appearance of the National Monument to the Forefathers wherever possible and to preserve and stabilize various components. The importance of this site to the Commonwealth is emphasized by well kept lawns, other components kept in a good state of repair and an inviting informative sign system. A well maintained site tends to discourage vandalism and promotes community support. All outdoor elements require regular maintenance regardless of age or condition.

The following contains a summary of general guidelines for protection, stabilization, preservation, restoration and/or maintenance. Because of the rapid advances in knowledge and techniques today, this should serve only as a general guide. Specific changes in these recommendations, particularly in regard to materials and methods, are expected over time.

These guidelines are provided for general information and are presented on a variety of levels. Most of these techniques and materials should not be used without appropriate training, and in most cases a professional should be consulted before attempting anything. Inappropriate use of these techniques and/or materials can cause irreparable damage. The majority of conservation work should be performed by a professional conservator, who should prepare a program of work specifying appropriate methods and materials for use. In some instances a conservator might be able to train people to perform some of the types of work involved, and should supervise any work done by volunteers.

Maintenance Guidelines

General Clean up

Issues

The National Monument to the Forefathers is currently maintained by DCR staff. The maintained area of the site is kept reasonably free of trash and leaves, and the grass is mown regularly. Leaves, fallen limbs and debris are removed in the spring.

Recommendations

Litter is a major problem in any public open space and one that must be controlled to create pride in a historic property. A neglected appearance seems to encourage vandalism or additional trash dumping. In this regard it is important to provide at least a moderate maintenance and management approach. Litter like paper, trash or debris should ideally be removed on a weekly basis and more often during periods of heavy visitation. Leaves should be removed during the fall and the grounds cleared of fallen branches.

Landscape Character and Vegetation

Issues

Vegetation Management

The primary goal of tree maintenance is to maintain healthy trees free of dead wood that could fall on people or structures. The reasons for pruning trees also include reducing hazards, maintaining or improving tree health and structure, improving aesthetics, or satisfying specific needs like: removing disease; removing dead, dying, interfering or obstructing branches; training young trees; eliminating screened areas to discourage loitering; and providing clearances for utility lines. The uncontrolled growth of trees and weeds hides vandals and can become a hazard to public safety.

Trees require pruning on a regular basis to protect the public from damage by falling limbs. Too many trees or trees of the wrong type can create shade that is too dense to support and maintain a stabilizing ground cover, making the surface subject to erosion. Too much shade can also be detrimental in that moisture could be retained for long durations, increasing the probability of biological growth on important historic artifacts.

Volunteer Growth

It is essential to maintain a landscape with an appropriate historic character. The character of a landscape is dynamic compared to the relative stasis of other historic structural components. Natural forces like landscape succession will change an unmaintained lawn into a forest in a relatively short period of time. The undeniable results of these forces are evident.

Lawns

The primary ground cover in maintained areas is grass. It is in fair condition with areas of herbaceous weeds. Bare spots are typically related to root competition from trees and/or dryness. Weed intrusion is primarily related to dryness and low fertility levels. Heavy shade conditions also impact lawn quality.

Most lawn areas need renovation, including proper pH level and fertilization. Maintaining a healthy lawn cover with adequate light, moisture and nutrients, and good maintenance procedures would reduce bare spots, weeds, moss and erosion.

Soils

Soil Tests: Soil analysis and testing helps determine the proper quantity and ratio of nutrients and other additives to improve a soil. Tests for pH and fertility levels should be made every 3 to 5 years to determine fertility changes made with basic treatments and to give a bench mark for further soil improvements. It typically also takes 3 to 5 years for the soil and the basic treatments to reach an equilibrium.

Recommendations

Vegetation Management

New plantings and pruning or removal of trees should be done with care. A permit should be obtained from the Massachusetts Historical Commission prior to the execution of new planting within the area of the preservation restriction.

Inspect trees to safeguard against threats to elements from root systems and falling or scraping branches. Inspections should be made on a yearly basis and after each storm where winds exceed 55 mph. Ideally trees should be pruned to remove potentially hazardous dead wood on a yearly basis, but safety pruning every 5 years by certified arborists is acceptable. A 5 year cycle of pruning will help maintain and preserve large old trees.

Trees should be pruned in such a manner as to preserve the natural character of a plant and in accordance with ANSI 300 standards. All pruning cuts should be made outside the branch collar. Remove all dead wood, suckers and badly bruised or broken branches to reduce potential injury or damage to people, vehicles and structures. Remove branches to provide 8 foot overhead clearance on walks and 12 foot clearance on drives.

The pruning of trees should only be performed or supervised by a certified arborist. It should be done by nonprofessional crews only during an emergency situation or when there is an immediate issue related to public safety. The removal of dead trees should also be done by certified arborists.

Root collars should be cleared of soil, mulch, stones, brush and other items that could hide or cause decay that could cause a tree to fail. Keeping root collars clean helps control girdling roots and decay that leads to tree decline and failure. Questionable trees with cavities, cracks or seams in main stems or branches, or fungi fruiting bodies on or around the root area should be assessed for potential tree failure.

Failure prediction with any sort of accuracy is difficult. However, performing a systematic approach of evaluating each part of a tree with proven procedures that the International Society of Arboriculture has adopted through the guide known as "A Photographic Guide to the Evaluation of Hazardous Trees in Urban Areas" will help to eliminate most of the suspected hazards. Remedial action such as pruning, installing support systems and removal will help reduce the failure percentages and the damage or injury to property or persons.

Tree Thinning: Choices must be made in terms of tree thinning and selective replanting in order to improve growing conditions for all of the site's vegetation while maintaining a collection of trees which gives character to the site's landscape.

Mulching: Mulch is very valuable in supporting plant growth. It allows the soil to remain open to receive moisture and promotes the exchange of gases between the soil and the air. All introduced plantings should be mulched. Trees growing in an area with a restricted root zone, low nutrient levels, pH imbalance, low moisture conditions and soil compaction decline faster as they mature. Grass and weeds also compete for nutrients and moisture. While the removal of turf or grass under the branch spread of trees is often recommended for improved tree health, it is often not appropriate where tree canopies are large in open areas.

Shrubs: As long as shrubs remain, spread fertilizer over the surface of the ground surrounding shrubs once a year during the spring. Soak the area thoroughly. Edge plant beds twice a month or as needed. Ornamental trimming or pruning should be consistent with the natural landscape and historic character. Plants should appear natural and healthy as opposed to geometric and fanciful. Prune to admit light and air to the center of the shrub. Prune only as plant growth requires, generally every 2 years. Prune spring flowering shrubs after they have bloomed. Prune summer flowering and other deciduous shrubs during the dormant season. Prune evergreen shrubs in late spring or early summer. Remove dead wood at any season.

Ground Cover: Where ground cover is preferred on steep slopes and/ or in wooded areas, keep weeded continually. Avoid disturbing runners. Prune regularly to maintain a low spreading appearance. Remove vertical shoots. Fertilize at the same time lawns are fertilized.

Vines: Many vines are not a suitable ground cover as they are difficult to control. Remove aggressive vines from the site.

Volunteer Growth
Most, if not all, volunteer species should be removed. Volunteer growth should be removed on a yearly basis during the months when frequency of mowing is reduced and maintenance crews have time to remove it. Because lawn areas and edges attract volunteer growth, lawns must be mowed on a regular basis to keep this under control. The edges of lawn areas and individual elements must also be constantly monitored to keep volunteer growth in check.

Lawns
Rehabilitating existing lawn areas: In large areas where weeds and other undesirable species should be removed, the soil should be loosened by power rake, vigorous hand raking or rototilling. Fertilizer and lime should be added as recommended by soil analysis. The fertilizer choice should be checked with a stone conservator as recommended herein under the discussion of soils.

Depressions that inhibit proper drainage of an area should be filled with topsoil to blend smoothly into surrounding grades. Care should be exercised with mounded or raised areas and regrading should be avoided or limited to avoid potential damage to subsurface elements. Bare spots should be topdressed, seeded and rolled. Water must be provided to maintain a sufficient moisture level to establish grass. The best time to plant a lawn in this area is between August 15 and October 1 to reduce weed infestation and maintenance requirements. If it is necessary to plant in the spring, plant as soon as the ground can be worked and when the soil is free of excess moisture.

Most seed mixes should incorporate improved, low maintenance, slow growing, drought resistant and shade tolerant seed cultivar mixes of Kentucky Bluegrass and Fescue.

Watering: Water lawns as necessary to maintain normal growth and color. Soak the entire root area. Avoid light, frequent sprinklings. Water is essential to establish a lawn. Watering established lawns during the dry months of summer, does not appear to be a realistic possibility at this time given the current budget, maintenance crew size and lack of an irrigation system.

Mowing: Mow to an average height of 3 to 4 inches. The most serious issue is the routine removal of grass in the immediate vicinity of trees. Power mowers can scar and damage trees. The best current solution is to mow with lawn mowers to within twelve inches of trees and then use weed whips [rotating nylon filament trimmers] to trim the remaining area.

Frequency of Mowing: An ideal schedule would include: mowing every 5 days from the beginning of the season to mid June; every 10 days from Mid June to mid August; and every 5 days from Mid August to the end of the season.

Rolling: Roll lawn areas in the spring as necessary to repair frost heaving irregularities caused during the winter. Use a light roller and roll the lawn when the soil is fairly dry, and freezing weather has passed.

Aeration: Aerate compacted lawn areas twice a year during the spring and late summer or early fall. Do not aerate when the soil is extremely wet or dry.

Erosion Repair: Repair erosion on steep banks utilizing the same methods required for lawn installation. Include 100% biodegradable erosion control fabric.

Weed, Disease and Pest Control: When chemical controls are recommended, the formula should be checked with a stone conservator before use. Provide appropriate pesticide application in late spring and early fall, if necessary. Do not treat a new lawn until its second year of growth. Do not burn the grass.

Pest Management and Plant Health

Insects, diseases and other pests are a normal part of nature. The safest and most responsible approach to preserve the site's plants while safe guarding the environment is Integrated Pest Management (IPM). IPM utilizes alternatives to chemicals for pest control and establishes a monitoring system for early detection. It requires a detailed plan to inspect specific plant species at specific times for evidence of problems. It also requires that trained personnel inspect the grounds, detect the presence of pests and apply the proper biological controls. While IPM is an essential program to pursue, current horticultural thinking recommends that grounds care move beyond IPM or incorporate it into the principles of Plant Health Care which involves the concepts of selecting the proper plant material for any given location and providing the supportive culture needed to maximize plant development and minimize stress.

Soils

Liming: Lime serves several important functions. It is of particular value in correcting the acidity of the soil. It also changes the structure of the soil, hastens bacterial action in the soil, aids in the liberation of plant foods which otherwise remain in the soil in an unavailable form, hastens the decomposition of organic matter and supplies a small amount of calcium, one of the essential plant foods.

Based on recent soil test results, limestone should be added at the rate of 50 lbs/1,000 square feet twice a year to raise the pH level of established lawns to the preferred 6.5. It should be applied in early spring and mid fall, 2 to 3 weeks prior to fertilizing. The soil pH must be at the proper level to make the benefits of a fertilizer available to plants. Lime should not be used in combination with animal manures or with nitrogenous fertilizers, as it causes the rapid release of ammonia. A fall application of lime provides time for it to break down in the soil before spring growth.

When applying lime for new lawn construction, it should be spread over the surface of the ground and thoroughly mixed with the upper few inches of soil. The rate of application depends upon the form in which the lime is applied and the texture of the soil. The rate of application of ground limestone should be determined by soil testing and should not exceed 75 pounds per 1,000 square feet at any one time. For new lawns lime should be applied either in early spring or late fall, with early spring [April] preferred. On established lawns or under trees, lime should only be surface applied so as not to disturb below ground elements or roots.

Fertilizing: Supplemental fertilizer improves vegetative health and vigor in a short period of time. Lawns and trees are both heavy consumers of nitrogen and they compete for it. Because nitrogen leaches from the soil, it should be applied annually. Application methods are different for trees and grass. If fertilizer is applied on the surface, the grass absorbs most of it.

Based on recent soil test results, lawns should receive an application of 20-3-12 at a rate of 5 lbs/1,000 square feet in late April, late June and very late August. Soil tests will be required to determine fertilization needs the following year. Lawn areas should be fertilized a minimum of twice a year to maintain a healthy lawn. Light, frequent applications of readily available nitrogen fertilizers are preferred over heavy, infrequent applications. Lawns in this area generally require 0.5 pounds of nitrogen per 1,000 square feet per growing month. Fertilizer should be applied with a mechanical spreader when turf is dry. This work could be either contracted out or performed by maintenance crews.

All trees and shrubs to remain in open areas and at the edges of wooded areas should receive an annual application of fertilizer to sustain a reasonable level of health. Fertilizing with a slow release fertilizer with a ratio of 3-1-1 will not only improve the health, but will also prolong the life of a tree. Trees should be subsurface fertilized to a depth of 12" at least every other year during the growing season, with spring or fall preferred. This could be contracted at the same time as pruning.

The chemical formulation of all fertilizers proposed for use should be checked by a stone conservator prior to use to prevent potential damage to historic artifacts. Ideally a nonacidic, slow release, organic fertilizer should be used to reduce the potential conflict between stone conservation and the desire to obtain healthy vegetation.

Circulation Systems and Materials

Issues

Well maintained, universally accessible circulation routes are key to the public's enjoyment of the site.

Recommendations

Paved Surfaces

Sweep clean drives and paths weekly from spring through fall. Repair paved areas as needed. Patch depressions of 1 inch or more annually. Repair cracks every 5 years.

Until the gravel is replaced, examine gravel walkway surfaces after each heavy rainfall, repair erosion gullies by topdressing with path materials and compacting. Maintain the path cross section to prevent collection or diversion of overland flow. Rake gravel surface as necessary to remove leaves, litter and other debris.

Maintain chip sealed surfaces as required for other paved areas. Hand sweep clean each spring to remove loose aggregate. Patch areas where aggregate has been removed due to other operations with methods and materials employed during the initial installation.

Snow removal is not provided at this site and is not recommended because of the chip seal surface. This assumes that the building will be closed during the winter season.

Structural Elements

Issues

Because this site is located in a northern temperate climate, structural elements are subjected to a wide range of temperatures. This thermal stress requires regular examination and subsequent maintenance of structural elements.

Recommendations

Exterior stone masonry needs routine, periodic maintenance at least once every 5 years. Inspect for cracked mortar, loose or broken stones and other movement annually. Repair at least every 5 years.

Stone Masonry Repair and Repointing

Repointing is probably the most common operation practiced in preserving and restoring old masonry structures. Improper repointing with soft mortars has been done on occasion in the past. But repointing that has been done since the introduction of hard cement mortar is more harmful. Poorly done repointing is difficult and expensive to correct. In extreme cases it causes irreparable damage to the physical structure as well as its appearance.

Masonry repairs should be performed by experienced conservation professionals. When choosing the type of mortar to be used in repointing, full consideration must be given to matching the old mortar in color, texture, aggregate, strength and hardness [density and porosity]. The new mortar used in repointing should have the same physical characteristics as the old, only if the old mortar was reasonably appropriate in the first place. It is best to repoint with mortar having the same density and absorbency as the stones in a structure.

Masonry repairs should be performed with a mortar formulation which contains at least equal parts of cement and Type S hydrated lime for repointing. It is important that mortar used for routine pointing is compatible with the softness or hardness of a stone. Use a color, aggregate and joint profile to harmonize visually with the adjacent work.

All joints that have loose mortar should be repointed. All surfaces to be repointed should be properly prepared and cleaned, removing all loose and deteriorated mortar. Joints should be raked out by hand. The depth of chipping and raking should be at least twice the width of the joint to a maximum depth of 1-1/2 inches. Care must be taken to avoid enlarging the width of joints. Mortar should be applied in lifts no greater than 1/2 inch at a time.

Masonry repairs should be supervised by experienced professionals. Specific but broad comments relating to this topic are as follows:

- Never use premixed bagged mortar or grout. These materials are too hard. They will not accommodate movement of the masonry and in rare cases they may overstress the stone edge.

- Masonry that has undergone excessive local movements should be rebuilt, not repointed. Do not exceed a joint width of 3/8 inch when rebuilding.

- Whenever possible, carry repointing below grade.

- Do not smear mortar on adjacent surfaces or on the joint being repaired.

- Where possible, tie thin elements together using stainless pins.

On masonry and stone fence or gate posts, the insertion points of horizontal metal fence rails should be repaired with appropriate pockets to receive the metal inside the masonry or stone surfaces.

Repointing weathered materials
Weathered stone in an old structure frequently acquires worn edges and rounded profiles. When repointing them it is advisable to recess the face of the new mortar slightly to keep the joint from becoming too wide and avoid spreading mortar over the edges of the stones. When repointing rubble, feather edges should be avoided. They break off easily, carrying particles of stone with them and leaving cavities through which moisture may enter.

The surface of an area that has been repointed or patched should be brushed so that some aggregate is raised before the mortar becomes hard. Alternatively, stippling the joint [marking it by touching it with the end of a stiff brush] before the mortar completely sets helps to give it a worn appearance. This surface texture retains a historic appearance and does not call as much attention to itself as a smooth mortar surface.

Sealants
The "Conditions Assessment" provides some recommendations related to the limited use of sealants in the conservation of the monument. A sealant is a contemporary material that has been used in historic applications to prevent the intrusion of moisture. The use of sealants should be limited because they are not visually compatible with the historic appearance of stone and masonry construction. Sealants also invade adjacent materials, making them extremely difficult to remove without removing some of the adjacent material. In addition, there is some degree of difficulty in controlling joint preparation and installation. Where sealants have been used, they are typically failing. It is preferable to use sealants only at expansion joints. In other locations, such as at a moving crack, they should only be used as a last resort. Caulking and sealing materials should not be used for repointing. Silicone sealants should not be used because of their tendency to absorb soil from soot and atmospheric pollutants. A fine aggregate can be applied to the surface of a sealant during the curing period to make it more closely match adjacent surfaces. Over time however, this aggregate has a tendency to erode away.

Sealant backings must be provided of preformed, compressible, resilient, nonwaxing, nonextruding strips of plastic foam of flexible, open cell polyurethane foam or nongassing, closed cell polyethylene, of a size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

Concrete Repair

With concrete steps and pavement on the site, maintenance will eventually become a greater issue than the repairs already required. In many instances repair is a preferable option to replacement. Remove damaged concrete [cracked, chipped, spalled, gouged, etc.] to a 2" minimum depth and 2" minimum beyond the damage in all directions. Roughen and prepare finish surfaces to accept new concrete material. In locations where reinforcing can be repaired, clean it to bright metal and prime with a zinc rich primer. In locations where it cannot be repaired but replacement is possible, provide in kind or epoxy coated replacement. Remove reinforcing where it is exposed, corroded and cannot be repaired or replaced. Seal all field cut ends in accordance with the manufacturer's recommendations. Keep reinforcing back 1-1/2" from exposed faces. Replace reinforcing where it has been removed with vinyl ester resin bars reinforced with fiberglass equal to "Rebar," as manufactured by IMCO Reinforced Plastics, Inc., Moorestown NJ.

In areas where concrete is to be repaired, install threaded dowels, vinyl ester resin reinforced with fiberglass equal to "Fibrebolt" as manufactured by IMCO Reinforced Plastics, Inc., Moorestown NJ, at 6" on center and 1-1/2" clear from exposed faces. Apply a bonding agent [equal to Nitobond Epoxy Gel 400C by Fosroc, Inc., Georgetown KY or Sonneborn Sonoprep by Chemrex, Inc., Shakopee MN] prior to placing concrete. Concrete should be air entrained and of the same strength as the concrete being repaired. The concrete should match the profile, finish and color of adjacent concrete.

Buildings

Issues

Maintenance of buildings is essential for the public use and enjoyment of the site as well as staff accommodation and equipment storage.

Recommendations

The floors should be cleaned daily, as should restrooms. Interior surfaces should be painted annually if needed. Exterior surfaces should be painted and cleaned as needed. Repaint structures as needed but not less than once every 5 years. Inspect roofs annually and repair upon discovery of any damage. Remove winter accumulations of leaves each spring. If public use is affected, repairs should be made immediately or further damage may occur. Heating, ventilating and air conditioning systems should be inspected semi-annually. Plumbing and electrical work should be inspected annually. Nonworking lights should be replaced immediately. Special equipment should be maintained in accordance with manufacturers recommendations.

Fences and Gates

Issues

Iron and Wood

Although both are relatively durable, they do require periodic inspections and maintenance to extend their useful lives.

Recommendations

Iron Fence and Gates

All metals that are rusting or have failing paint finishes should be cleaned down to bright metal and properly primed and coated to prevent further corrosion.

The preferred method of cleaning and paint removal from historic iron is using low pressure, dry grit blasting on site. It is the most effective, being fast, thorough and economical. The pressure should be less than 100 pounds per square inch using a fine aggregate of iron slag or sand, but not copper slag. The aggregate should not be very sharp or very hard. It is preferable not to use wet sandblasting or flame cleaning. Hand scraping, chipping and wire brushing is not as effective as other methods. Chemical rust and paint removal methods should generally be employed in the shop as opposed to in the field. When employing pressure blasting, comply with local building codes and environmental authorities, and take every precaution to protect adjacent materials, including plant materials.

Bare surfaces should be painted within 48 hours of proper cleaning. The preferred paint system for cast iron includes a two part epoxy primer and an aliphatic or acrylic polyurethane finish coat. An acceptable, but less durable, less expensive alternate for non corrosive environments includes an application of a passivating material, such as a high zinc dust content [90% zinc content minimum] primer, then a red oxide alkyd metal primer and alkyd enamel finish. Concealed surfaces should be thoroughly prime coated prior to concealment. A shade of black appears to be the appropriate historic color.

If spray operations are used, extreme caution should be exercised to prevent overspray from coming into contact with persons, motor vehicles, trees, surrounding buildings and other objects [particularly historic artifacts] not intended for treatment.

Paint as often as required to maintain good condition and appearance, but not less than once each ten years. When coatings fail, metals corrode. Paint coatings should be monitored annually for peeling and failure.

In the design, fabrication and installation of gates, allowances should be made for the thermal movement that results from changes in ambient temperature to prevent buckling, opening up of joints, overstressing of components or connections and other detrimental effects. Slip joints should be provided between embedded elements and connecting rails for lateral movement. Slip joints should consist of slotted holes and Teflon washers.

Galvanic action and other forms of corrosion should be prevented by insulating metals and other materials from direct contact with incompatible materials. Although the corrosion or oxidation of aluminum is far less destructive to stone than iron's "rust jacking," it is nevertheless unsightly. Aluminum replacement parts should not be used in cast iron or steel gates.

Where metal gate posts are inserted into masonry or concrete, there should be no pockets to collect moisture. The preferred joint material in these locations is molten lead or a lime-sand mortar. Sealant will shrink and embrittle over time. The use of joint sealants within metal fabrications is appropriate to prevent moisture from collecting in metal to metal joints. Sealants for this use should be a premium grade polyurethane based elastomeric sealant conforming to ASTM C920, Type S, Grade NS, Class 25 equal to Sikaflex-1a as manufactured by the Sika Corporation, Lyndhurst NJ of a color to match the paint finish.

Wood Fences
Inspect fences once per season and clean as needed. Repairs should be made immediately upon discovery of need or notification. Replace and/or repair missing and broken components. Support posts should be inspected at least once a year for stability to insure structural support. Replace those that are weak or structurally unsound. Prepare and paint or preservative stain as appropriate every 5 years.

Site Amenities
Issues
These are the elements that invite the public to use the site. They also provide the conveniences that much of the public has come to expect. They should be kept in a condition that sustains that sense of invitation.

Recommendations
Signs: Signs should be kept clean and legible. Text on all signs should be reviewed at least once every 5 years to insure that it is current.

Benches: Inspect at least 4 times a year including all fasteners and connections. Repairs should be made immediately upon discovery of need or notification. Maintain a paved surface beneath these elements.

Picnic Tables: Wash clean tables daily during periods of heavy use and weekly at other times. Clean and inspect tables weekly at other times.

Flagpoles: On an annual basis, inspect flagpole function for appropriate raising and lowering of flag. Make repairs immediately upon discovery of failure.

Utilities

Issues

Maintenance of recommended utility systems will be essential for the rehabilitation of the site.

Recommendations

Storm Drainage System: Until the existing system is removed, inspect storm structures 4 times a year and remove sediments from catch basins after the wet season or more often as required. Clean storm piping at least every five years or more often as required. Remove all mud, leaves and other debris. Repair fractures in masonry drainage structures as required.

Water Supply and Irrigation Systems: Inspect all working parts and plumbing for leaks or faulty operation at least annually and repair at once. Inspect operation and distribution monthly and make repairs at once. Drain each fall to prevent damage from frost and turn on each spring. Develop and maintain record drawings of the irrigation system.

Light Fixtures: Repair damaged metal surfaces as damage occurs. Spot check and repair all surfaces every 5 years. Replace bulbs as needed averaging every 2 years. Replace ballasts every 10 years.

Vandalism

Issues

Vandalism tends to be more of a problem in sites without adequate security measures and where visibility is difficult. The impacts of vandalism include vandalized monuments, painted graffiti and broken glass. The latter is usually found at the rear of a site, away from public streets. Today, evidence of recent vandalism appears to be minimal.

Recommendations

Efforts should continue to discourage the misuse of this historic site and remove any evidence of vandalism. A stone conservator should be consulted to determine the gentlest effective means to remove graffiti from the monument. The "Conditions Assessment" provides recommendations for training staff to promptly removing graffiti with an in house graffiti removal kit.

Vandalism and other problems should be reported promptly to DCR staff. The Police Department should be notified immediately if an act of vandalism or other delinquency is in progress.

Landscape Maintenance Time Requirements

The chart below includes an estimate of the time required for various landscape maintenance tasks. Items not shown include: general inspection and repair of flagpoles, signs and fences, as well as other miscellaneous items like enforcement of rules and regulations, travel time, and equipment repair and maintenance. Time for work in wooded areas, other than litter pick up has been excluded because that will be provided by other DCR staff. Time for chip seal repairs has been excluded as that should be provided by outside vendors. This does not include time for inspection and cleaning of the storm drainage system as that is scheduled for removal. Event and Building maintenance has also been excluded.

Monthly Distribution of Continuous Tasks

TASKS	Frequency											
	J	F	M	A	M	J	J	A	S	O	N	D
Lawns												
Mowing	-	-	-	-	•	•	•	•	•	•	-	-
Staff												
Edge Trimming	-	-	-	-	-	•	•	•	•	-	-	-
Rolling	-	-	-	-	•	-	-	-	-	-	-	-
Fertilize	-	-	-	-	•	-	-	-	•	-	-	-
Weed/Disease/												
Pest Cont.	-	-	-	-	•	-	-	-	•	-	-	-
Mechanical Aeration	-	-	-	-	-	-	-	-	•	-	-	-
Seed Bare Areas	-	-	-	-	-	-	-	-	•	-	-	-
Leaf Removal	-	-	-	-	-	-	-	-	-	-	•	-
Plants												
Mulch Beds	-	-	-	•	-	-	-	-	-	-	-	-
Disease & Pest Control	-	-	-	-	•	-	-	-	•	-	-	-
Dead Plants	Remove within one week											
Paved Surfaces												
Hand Sweep Clean	-	-	-	•	-	-	-	-	-	-	-	-
Sweep/Vacuum Clean	-	-	-	-	•	•	•	•	•	•	-	-
Irrigation System												
System Start Up	-	-	-	-	•	-	-	-	-	-	-	-
Maintain and adjust	-	-	-	-	•	•	•	•	•	•	-	-
System Shut Down	-	-	-	-	-	-	-	-	-	•	-	-
Litter												
Trash Pick up	-	-	-	•	•	•	•	•	•	•	•	-
General Litter Removal	-	-	-	•	-	-	•	-	-	•	-	-
Lightning and Security Systems												
Inspect Systems	•	•	•	•	•	•	•	•	•	•	•	•
Monument and other Masonry Elements												
Inspect, clean and adjust protective covers on bas-reliefs	-	-	-	•	-	-	-	-	-	•	-	-
Remove organic growth from lower sections of monument and entrance posts	-	-	-	•	-	-	-	-	-	-	-	-
Vandalism												
Inspect for Graffiti	•	•	•	•	•	•	•	•	•	•	•	•
	Remove and repair damage within one week											

Landscape Maintenance Time Requirements for Continuous Tasks

Area and Operation	Average Frequency per Year		Minutes / 1,000 SF	Area SF	Man Hours per Year	
Lawns						
Mowing	24		1.1	174,493	77	
Edge trimming	12		25	1,800 lf	9	
Rolling	1		1.1	174,493	3	
Fertilizing	2		1.6	174,493	9	
Weed / Disease / Pest Cont	2		4	174,493	23	
Aeration	1		1.1	174,493	3	
Seed Bare Areas	1		30	17,449	9	
Leaf Removal	1		10	174,493	29	162
Planted Areas [General Maintenance]						
Mulch beds	1		30	5,000	3	
Prune	3		20	x50	5	
Disease & Pest Control	2		10	5,000	2	
Dead Plants	2		-	-	16	26
Irrigation System						
System Start Up	1		2.5	174,493	7	
Maintain and adjust system	6		6.5	174,493	113	
System Shut Down	1		2.5	174,493	7	127
Drives						
Hand Sweep	1		10	55,526	9	
Sweep / Vacuum	24		4	55,526	88	
Repair	1		20	55,526	18	115
Walks						
Sweep / Vacuum	24		4	15,081	24	
Repair	1		20	15,081	5	29
Site Amenities						
Clean tables	24		3	x4	5	
Clean benches	24		3	x16	19	
Inspect and Repair	3		240	-	12	36
Litter						
Litter pick up	24		0.1	245,100	98	
Woods litter pick up	3		0.1	219,467	11	109
Vandalism						
Repair grafitti / damage	8	60		1,600	13	
Repair turf damage	2	1.5		174,493	9	22
Total Time requirements per year						626

Landscape Maintenance Time Requirements for Periodic Tasks

Area and Operation	Average Frequency per Year	Minutes per 1,000 SF	Area in SF	Prorated Man Hours per Year
Lawns				
Soil test	Every 4 years	3.5	174,493	3
Lime Application	Every 5 years	15	174,493	9
Woods and Planted Areas				
Deep root fertilize	Every 2 years			8
Safety prune	Every 5 years			24
Paved Surfaces				
Repaint pkg spaces	Every 2 years			2
Repair cracks	Every 5 years			5
Metal Surfaces				
Repair and paint	Every 5 years			10
Wood Surfaces				
Repair and Stain	Every 5 years			10
Site Lighting				
Replace bulbs	Every 2 years			15
Replace ballasts	Every 10 years			3
Monument				
Examine Conditions	Every 5 years			3
Total Time requirements per year				92
Grand Total Time requirements per year				**718**

The above estimate assumes implementation of the master plan recommendations.

Landscape Maintenance Equipment and Material Requirements

Issues
Because this property is a relatively new acquisition for DCR, there is no current equipment or materials on site dedicated for the maintenance of these grounds. The limited amount of existing equipment is stored on site and used to maintain this and two other sites [Plymouth Rock and the Myles Standish Monument in Duxbury].

Recommendations
Provide the following equipment to assist with proper maintenance of the site:

- Lawn Tractor with attachments
- Commercial grade push Lawn Mowers [2]
- Lawn Cart
- Golf Cart with truck style back
- Gas powered shrub trimmers [2]
- Gas powered weed wackers [2]
- Aerator
- Lime/Fertilizer Spreader
- Gas powered Chain Saw
- Power Vacuum [2]
- Power Rake [2]
- Leaf Blower [2]
- Miscellaneous Tools and Equipment: Weed Wackers, Brooms, Leaf and Garden Rakes, Spades, Square Faced Shovels, Wheel Barrows, Pruning Shears, Paint Brushes, Ladders, Ropes and Containers for Gasoline.

In addition, provide the following materials:

Annual Material Requirements

Bark Mulch	60 Cubic Yards
Fertilizer	1 Ton
Lawn Seed	90 Pounds
Screened Topsoil	100 Cubic Yards
Jute Mesh	500 Square yards
Weed Wacker Filament	1,000 Linear Feet

Periodic Material Requirements [over a 10 year period]

Lime	13 Tons
Irrigation Heads	50
Paint	50 Gallons
Stain	20 Gallons
Light Bulbs	80
Light Ballasts	16

While the procedures outlined in these guidelines are accepted practices in the field of conservation, the authors do not assume any responsibility for the preservation, conservation or restoration work of readers of this publication.

Detail of secondary figures on monument

BUSINESS PLAN

Staffing

Assessment

While the purpose of this plan is to focus only on the National Monument to the Forefathers, it should be noted that staff for this site also attends to two other sites [Plymouth Rock and the Myles Standish Monument in Duxbury]. The National Monument to the Forefathers encompasses 10.66 acres of land and represents about 20% of the total land area currently maintained by the existing maintenance staff.

There are currently 2 staff on a year round basis. The level expands during the high visitor season to 5 interpretive staff and 3 to 4 maintenance staff. Glenn Holmes is responsible for site supervision. There are currently no on site staff. Lack of staffing and funding has hampered maintenance of the site and limited visitor services.

Recommendations

The time requirements shown in the previous chapter are only for the National Monument to the Forefathers and do not take into account the many other responsibilities of department staff. More than 90% of the landscape maintenance requirements occur within an 8 month time frame between April and November.

The total identified annual landscape maintenance time requirement for the National Monument to the Forefathers is about 718 hours. Using 1,840 working hours annually per staff person, which allows for holidays, vacations and sick leave, the landscape maintenance time requirements indicates that the National Monument to the Forefathers would benefit most with the partial dedication of one full time staff person in combination with the partial dedication of one seasonal position during the 8 month busy season. This should be supplemented by other DCR staff for maintaining the health of wooded areas.

Maintaining a continuity of maintenance staff with a commitment to the preservation of a historic place is critical. It is also beneficial that this specialized knowledge becomes transferred to new staff members over time. The issues of continuity and transfer of specialized knowledge make the value of full time positions much more significant to the DCR than seasonal positions. The multiple skills of the current supervisor are essential for an effective grounds crew. These skills must be maintained for DCR to continue to have an efficient and successful grounds maintenance operation.

Each landscape character has its own requirements and potential hazards that maintenance personnel and budgeting or funding entities must be aware of. Staff for the full time positions should have a background in grounds maintenance. There should be maintenance standards and an interest in upgrading training beyond a basic level. There is no current training other than on the job training.

Periodic help for tree pruning and volunteer growth removal at the National Monument to the Forefathers from other DCR personnel and volunteers will be required. The long range reality is that trees require continual, recurring work. Each tree needs to be examined and pruned at least once every five years. With the exception of seasonal positions, unskilled labor for this work is not desirable. The removal of lower level volunteer growth is an appropriate activity for unskilled volunteers.

DCR staff should be responsible for inspection and cleaning, mowing, trimming, litter and leaf removal, graffiti removal, repair of most types of vandalism, adjusting the protective covers on the bas-reliefs, in-house maintenance, removing organic growth from the entrance posts and lower sections of the monument, replacement of light bulbs, opening and closing the gate each day and enforcement of rules and regulations.

All other repairs for lighting, lightning and security systems should be provided by specialty firms. A stone conservator should examine masonry and sculpture conditions and develop recommendations for further review or interim treatment.

Interpretive services should be provided by DCR staff. This would require a minimum of 2 positions from May through October each year to provide a presence on the site each day for the tourist season. While it is highly desirable for DCR staff to provide interpretive services, members of the friends group could to trained to assist with this task until such time as DCR staff are in place.

Operational Budget

Asessment

The National Monument to the Forefathers is not a revenue generating property, nor is it likely to become one. Operational funding is at the discretion of the Commonwealth. Understanding that this property is a relatively new acquisition, this site does not have a current operational budget.

Recommendations

Given the existing and potential levels of use and activity, funding should provide for the recommended staffing levels and other operational costs.

Business Plan

FY 2006

Operational Costs

Staff:	Cost	
1 Long term Summer Seasonal Supervisor [April to October]	$15,500	
1 Long term laborer	12,750	
2 Seasonal workers [10 weeks]	9,000	
2 Long term interpreters [May – October]	21,250	
		$58,500
Equipment:		
1 Lawn tractor w/ attachments	10,000	
1 Golf Cart w/ truck style back	10,000	
2 Commercial grade push lawn mowers	1,250	
2 Gas powered hedge/bush trimmers	1,000	
2 Gas powered weed whackers	1,000	
1 Gas powered chain saw	750	
1 Lawn cart and various hand tools	1,500	
		25,500
Operational/Maintenance:	6,000	
		6,000
Staff and Equipment and Maintenance Total:		90,000
Annual Utility Costs:		
Gas, Electricity, Telephone and Water/Sewage		10,500
[Based upon completion of capital improvements]		
Total Operational Costs:		100,500

Capital Costs

Priority One:	
Resolution of Public Safety Issues and Monument Protection [Early Action Projects]	276,000
Total FY 2006 Operational and Capital Costs	$376,500

FY 2007

Operational Costs

Total Operational Costs [FY 2006 costs - equipment + 5% inflation]:	79,000

Capital Costs

Priority Two:	
Restoration and Enhancement of the Prime Assets of the Park*	541,000
Total FY 2007 Operational and Capital Costs*	$620,000

FY 2008 -
Operational Costs

Total Operational Costs:	83,000
Capital Costs	
Priority Three: Use Enhancement*	1,127,000
Total FY 2008 Operational and Capital Costs*	$1,200,000

FY 2009
Operational Costs

Total Operational Costs:	87,000
Capital Costs	
Priority Four: Resource Enhancement*	355,000
Total FY 2009 Operational and Capital Costs*	$442,000

Note: * includes an assumed 5% inflation per year.

Other Potential Costs

Land Acquisition [Monument House]	to be determined
Area Lighting	to be determined
Expansion of Paved Area at base of Monument	to be determined

Partners

Partnerships

Assessment

Partnerships formed between municipalities and local constituency groups like neighborhood associations, various societies and friends groups can be beneficial for parks. These relationships are essential for site management and successful fund raising. Local constituency groups are effectively the eyes and ears for these resources, providing oversight and watchdog functions. Local constituency groups may also provide support for grant writing activities. Incorporation as nonprofit entities enables them to receive funds from charitable foundations, corporations and individuals where the state is ineligible.

Most state owned recreation sites like the National Monument to the Forefathers have no endowment funds. Care and restoration is funded primarily by the efforts of the Commonwealth and the use of matching grants, if available.

A new friends group with approximately 120 members was recently formed for the National Monument to the Forefathers. They are currently raising funds with an initial goal of $250,000. There is no MOU in place yet. The group needs direction for projects, both those managed by DCR as well as appropriate efforts for volunteers [which will not conflict with other groups].

Recommendations

This plan provides guidance in terms of both focal points for fund raising and appropriate activities for volunteers. Constituency group and volunteer efforts could be directed toward developing strategies and efforts to preserve and improve this park including cleanups, public education, interpretation, special events, and the development of guided walks to increase public awareness of this important site. With the assistance of local constituency groups, support can be created by enlightening people as to the value or significance of this property to the Commonwealth. Education can play a prime role in building community support.

Volunteer involvement is an integral part of the success of many projects like this. They provide the enthusiasm, energy and driving force behind most projects. Much responsibility falls to those faithful volunteers who see a project through from beginning to end. Because of the nature of volunteer staff, a coordinator, preferably a paid DCR position, is essential. The coordinator takes charge of all the varied talents and time schedules of volunteers, sets timetables for goal accomplishment, assigns tasks and follows up to insure that they are completed. This person keeps others informed and on track, and insures that each participant understands the project and his or her part in it.

The Friends Group for the National Monument to the Forefathers will be the primary advocacy voice to insure funds are dedicated to the care and improvement of the park. An MOU should be developed between the Commonwealth and friends group. Once that is in place the friends group should apply for a "fix-it-first" matching grant with the Office of Public/Private Partnerships at the Executive office of Environmental Affairs. Through this program, the funding of which varies from year to year, friends groups receive a dollar-for-dollar match for projects that address resource protection and capital improvements at DCR facilities.

In addition, the Town of Plymouth has passed the Community Preservation Act [CPA], which supports preservation, open space and affordable housing projects through a real estate tax surcharge. CPA funds, which are administered by a local Community Preservation Committee, may be used for projects on state property, though the state cannot be an applicant. The friends group, which has already been in contact with Plymouth's Community Preservation Committee, should continue to pursue this source of funding.

Donations from the friends group, including those associated with a "fix-it-first" project or a CPA grant, would be deposited into the DCR's Conservation Trust. Depending on the nature of the project being funded, monies from the Conservation Trust are sometimes subject to an indirect charge from the Department of Administration and Finance. This charge is currently 23.96%.

If the National Monument to the Forefathers were listed as a National Historic Landmark, it would be eligible for a Save America's Treasures grant. Partnerships should be pursued and formed with other potential organizations, agencies or corporations that would be interested in underwriting specific expenses.

Recognition of Contributions

Issues

As funds are raised for improvements, donor recognition becomes an issue of concern.

Recommendations

Guidelines for donor recognition provided by the Office of Public Private Partnerships should be followed. Plaques, if necessary, should be uniform and grouped in an appropriate location so as not to detract from the primary experience of the park. A minimum gift level should be set to at least cover the cost of purchasing and installing the gift and memorial plaque, and preferably also cover ongoing costs of maintenance and eventual replacement. It is preferred that donations be made to an endowment fund.

Administrative Management

Landscape Stewardship Guidelines

In July, 2003 state legislation established the Department of Conservation and Recreation (DCR), consisting of a Division of Urban Parks and Recreation, a Division of State Parks and Recreation, and a Division of Water Supply Protection. In addition, the legislation required the preparation of management plans for state parks, forests and reservations under the management of DCR (Chapter 21, Section 2F). This legislation states that management plans shall include guidelines for operation and land stewardship, provide for the protection and stewardship of natural and cultural resources, and shall ensure consistency between recreation, resource protection, and sustainable forest management.

The Land Stewardship Zoning Guidelines define three types of zones to address the legislative requirement and are intended to provide a general land stewardship zoning framework that is flexible and that can guide the long-term management of a given DCR property or facility. The three zones may be supplemented with significant feature overlays that identify specific designated/recognized resource features. DCR parks, forests and reservations are also subject to specific policy guidelines and/or performance standards and applicable environmental laws and regulations of the Commonwealth. The guidelines provide a foundation for recommendations that will address resource stewardship and facility management objectives, and are intended to cover both existing DCR property or facility conditions and desired future conditions for that property or facility.

Applicable Land Stewardship Zones

This property has two applicable landscape stewardship zones and a significant feature overlay. Zone two guidelines are applicable to wooded areas of the site and zone three guidelines are applicable to maintained areas of the site. Because there is a preservation restricion on a portion of the property, a significant feature overlay is also applicable.

Wooded Areas: Zone 2

This Zone includes areas containing typical yet important natural and cultural resources on which common forestry practices and dispersed recreational activities can be practiced at sustainable levels that do not degrade these resources and that hold potential for improving their ecological health, productivity and/or protection through active management. Examples include terrestrial and aquatic ecosystems characterized by a diversity of wildlife and plant habitats, rare species habitat that is compatible with sustainable forestry and dispersed recreation, agricultural resources, and resilient cultural sites and landscapes. Zone 2 areas may be actively managed provided that the management activities are consistent with the approved Resource Management Plan for the property.

General Management Guidelines

- Management approaches and actions may include a wide range of potential recreational opportunities and settings that are consistent and compatible with natural resource conservation and management goals.
- Utilize Best Management Practices for forestry and other resource management activities to encourage native biodiversity, protect rare species habitats and landforms.
- Protect and maintain water quality by providing for healthy functioning terrestrial and aquatic ecosystems.

- Provide a safe, efficient transportation network with minimal impact on natural and cultural resources while serving public safety needs and allowing visitors to experience a variety of outdoor activities.
- New trails may be allowed dependent upon existing area trail densities, purpose and need, physical suitability of the site, and specific guidelines for protection of rare species habitat and archaeological resources.
- Sustainable forest management activities may be undertaken following guidelines established through ecoregion-based assessments, district level forestry plans, current best forestry management practices, and providing for consistency with resource protection goals.
- Roads may be constructed if access for resource management or public access is needed and construction can be accomplished in an environmentally protective manner. Existing roads will be maintained in accordance with the DCR road classification system and maintenance policy.
- Additional site-specific inventory and analysis may be needed prior to any of the management activities described above to ensure that no adverse impacts occur to previously un-documented unique and sensitive resources and landscape features.

Maintained Areas: Zone 3

This zone includes constructed or developed administrative, maintenance and recreation sites, structures and resilient landscapes which accommodate concentrated use by recreational visitors and require intensive maintenance by DCR staff. Examples include areas developed and deemed appropriate for park headquarters and maintenance areas, parking lots, swimming pools and skating rinks, paved bikeways, swimming beaches, campgrounds, playgrounds and athletic fields, parkways, golf courses, picnic areas and pavilions, concessions, and areas assessed to be suitable for those uses.

General Management Guidelines

- The management approach and actions will emphasize public safety conditions and provide for an overall network of accessible facilities that meets the needs of DCR visitors and staff.
- Maintenance of these facilities and associated natural and cultural resources, and new construction or development, will meet state public health code, and state building code and environmental regulations.
- Historic restoration, rehabilitation or reconstruction for interpretation or adaptive reuse of historic structures will be undertaken only in conjunction with a historic restoration plan.
- To the greatest extent possible, construction will include the use of "green design" for structures, such as use of low-flow water fixtures and other water conservation systems or techniques, solar and other renewable energy sources, and the implementation of Best Management Practices to protect the soil and water resources at all facilities.

Preservation Restriction: Significant Feature Overlay

The land stewardship zones may be supplemented with significant feature overlays that identify specific designated/recognized resource features. These significant features are generally identified through an inventory process or research, and are formally designated. The purpose of these overlays is to provide more precise management guidance for identified resources and to recognize, maintain, protect, or preserve unique and significant values, regardless of the zone in which they occur.

Policies/Regulations

Assessment

This property was listed on the National Register of Historic Places in 1974. As such, changes and improvements to the property must follow the *Secretary of Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*. In addition, the property is included in the Plymouth Historic District, a local historic district created in 1995. Local historic district guidelines also apply. Work must be reviewed by the Massachusetts Historical Commission [MHC] and the Plymouth Historic District Commission [PHDC].

The National Park Service provides definitions and standards for four approaches to the treatment of historic resources. The overall treatment approach recommended for the National Monument to the Forefathers Landscape is rehabilitation, which allows for the accommodation of increasing use by the public alongside preservation of the historic character of the site. This approach also allows for the retention of some significant later additions to the landscape, such as the pyramidal bollards and granite shells that were added to the site in the twentieth century. In some cases, consideration should be given to restoring particular landscape elements to their appearance during the site's period of significance [1855-ca. 1897].

A Preservation Restriction that includes a 450′ diameter circular area that extends just beyond the circular drive around the monument was placed on a portion of the property in 1987. The restriction requires continued maintenance, repair and administration of the property to preserve the architectural, archaeological and historic integrity of the property in a manner satisfactory to the MHC. The restriction allows inspection of the property by the MHC to determine compliance and gives the Commission authority to review and approve plans and specifications for alterations to the property other than ordinary maintenance and repair, or minor alterations that do not affect the integrity of the property.

With the acceptance of a preservation restriction, the MHC has jurisdiction over all proposed changes in the area of the preservation restriction. All excavation in that area, to any depth, requires review and approval in the form of a permit from the MHC and the advice of a professional archaeologist. In addition, because of the site's National Register status, all work at the property, including that outside of the boundaries of the preservation restriction, must be reviewed by the MHC.

In addition, the Plymouth Historic District Commission [PHDC] has jurisdiction over signage [including historical markers and hardware], structures [monument, garage and restrooms] and landscape treatment [paving and fences] related to appropriateness. Failure to apply for proper Commission approval for work in the Historic District constitutes a violation of Chapter 40C of Massachusetts Law is punishable to the extent of the law, which specifies fines of up to $500 per day for unapproved work.

Recommendations

Whenever any type of work is contemplated, review with MHC and PHDC first to determine if permitting or an application for a certificate of appropriateness is required.

Recreation Management Issues

Assessment

Other than routine maintenance, there are no site management practices in place at this time. Tour buses arrive and park along the circular drive as do other visitors, sometimes along the outside, sometimes along the inside of the drive. Picnicking reportedly occurs, but there are virtually no facilities to accommodate this activity other than a single picnic table near the garage. Dogs on leashes are allowed on site. They have been observed both on and off leash. Dog feces was also observed in numerous locations.

Recommendations

Parking along the circular drive should be limited to the outside edge of the drive so as not to obstruct views of the monument and for public safety reasons. Picnicking should be encouraged in the maintained areas, but tables should be only be provided near the multipurpose building. Given that there are no plans to change current status of allowing leashed dogs on site, the public should be reminded of current public heath laws regarding picking up after dogs. No facilities, like "mutt mitts" or trash receptacles, to encourage this activity should be provided. Staff at Plymouth Rock has responsibility for emptying trash receptacles only from about Thanksgiving to Easter. Others have responsibility for the majority of the tourist season. There is no apparent reason for adding such a year round responsibility at this site.

Update and consolidate park rules and regulations. The following is recommended for consideration.

Hours

The National Monument to the Forefathers is open for visitation from sunrise to sunset.

Selected Rules and Regulations Concerning Visitors

Visitors are reminded to conduct themselves in a manner in keeping with the dignity of this site. All noisy and disorderly persons will be expelled from the site.

All persons are prohibited from writing upon or otherwise defacing any monument, fence, sign or other structure within or belonging to the Commonwealth.

All persons are prohibited from gathering any flowers, either wild or cultivated, or from cutting, breaking or otherwise injuring any tree, shrub or plant, or from annoying birds, squirrels or other harmless animals within the site.

No vehicles shall be turned around except at points where drives intersect. No vehicle shall be driven at a speed in excess of fifteen (15) miles per hour in the site.

All drivers are responsible for any damage done by themselves or the vehicle in their charge.

Dogs will not be admitted into the site unless leashed.

Prohibited Activities and Uses

- Sitting on the monument
- Monument rubbing
- Unleashed dogs
- Littering
- Loud or unseemly conduct or music
- Drinking of alcoholic beverages
- Athletic games and jogging
- Mini-bikes, go-carts, bicycles, skateboards, rollerblades, roller skates and motorcycles
- Peddling or soliciting in any form

Public Safety, Security and Public Relations with Abutters

Assessment

Vandalism is the main concern in the developed area of the site, particularly around the monument. In the wooded areas of the site, public safety concerns include the hazard of dead trees and limbs, manmade and other debris on the forest floor and erosion. The sites of 2 small fires were noted on the west side at the edges of wooded areas.

Vehicles enter the park after hours creating a disturbance for neighbors. Vehicles also occasionally drive onto lawns damaging the turf. The potential of overly bright illumination late at night is another likely concern for neighbors.

Recommendations

An improved security system, addressing deferred maintenance in wooded areas and resolution of erosion issues should allay concerns of park users and abutters related to public safety and resource protection.

Maintain gates at vehicular entrances. Lock the gates at park closure in the evening and unlock at park opening each day. Along the edge, maintain a fenced, vegetated or other appropriate barrier edge to discourage unauthorized vehicular access into the park.

Turn off lights at the monument at 10 PM to reduce disturbance to neighbors, except for special events when lights should be turned off no later than 11 PM.

View of rear of monument

APPENDICES

References

Arbo, Mindy, *National Register of Historic Places Inventory – Nomination Form*, 24 July 1974

Doherty, Joanna, *Cultural Landscape Report and Preservation Recommendations*, National Monument to the Forefathers, Massachusetts Department of Conservation and Recreation, January 2004

Legislation mandating the preparation of resource management plans, Massachusetts General Laws Chapter 21, Section 2F effective July 1, 2003

Preservation Restriction Agreement between the Commonwealth of Massachusetts and the Pilgrim Society, 13 April 1987

Preservation Technology Associates, Inc., *Historic Assessment*, National Monument to the Forefathers, June 2003

SOIL ANALYSIS REPORT FOR ESTABLISHED TURF 05/27/05

SOIL AND PLANT TISSUE TESTING LAB
WEST EXPERIMENT STATION
UNIVERSITY OF MASSACHUSETTS
AMHERST, MA 01003

LAB NUMBER: S050525-113
BAG NUMBER: 62527

SOIL WEIGHT: 5.62 g/5cc
CROP:

A PLANT HEALTH CARE CONSULTANT COMMENTS:
54 OLD MARLBORO RD
MAYNARD, MA 01754

LIMESTONE AND FERTILIZER RECOMMENDATIONS FOR ESTABLISHED TURFGRASS

Apply 93 lb of calcitic limestone/1000 sq ft in split application.
Do not apply more than 50 lb/1000 sq ft at one time.
Split application between early spring and mid-autumn.

Recommendation: 0 lb/1000 sq ft P2O5, and 4 lb/1000 sq ft K2O.

To provide the above recommendation you may follow the directions below, or you may devise your own fertilizer program using the recommended amounts of phosphorus (P2O5) and potassium (K2O) along with one pound of Nitrogen per 1000 sq feet. It may necessary to raise nutrient levels over several applications.

Apply a 20-3-12 fertilizer @ 5 lbs/1000 sq ft in late April, late June, and very late August.
If more convenient you may substitute the late April recommendation with the same application made 1 to 2 weeks after your last fall mowing.
Follow these recommendations for two years. Retest the following year.

Consult the interpretation sheet enclosed or obtain one of the Turf Guides referenced on the backside of the interpretation sheet.

SOIL pH 4.9 NITROGEN: NO3-N = 30 ppm NH4-N = 2 ppm
BUFFER pH 6.2 ORGANIC MATTER: 4.6 % (Desirable range 4-10%)

NUTRIENT LEVELS:	PPM	Low Medium High Very High
Phosphorus (P)	13	XXXXXXXXXXXXXXXXXXX
Potassium (K)	40	XXXXXXXX
Calcium (Ca)	366	XXXXXXXXXX
Magnesium (Mg)	59	XXXXXXXXXXXX

CATION EXCH CAP 10.0 Meq/100g
PERCENT BASE SATURATION K= 0.9 Mg= 4.3 Ca=16.3
MICRONUTRIENT LEVELS ALL NORMAL

EXTRACTABLE ALUMINUM: 85 ppm (Soil range: 10-250 ppm)

EXTRACTED LEAD (PB) 11 PPM. ESTIMATED TOTAL LEAD IS 158 PPM.

The lead level in this soil is low.

VISIT www.umass.edu/plsoils/soiltest FOR FURTHER INFORMATION ON SOIL TESTING AT UMASS.
TO CONTACT THE LAB: EMAIL soiltest@pais.umass.edu PHONE (413-545-2311).

UMASS.
Soil and Plant Tissue Testing Laboratory
West Experiment Station
University of Massachusetts
Amherst, MA 01003-8010
413-545-2311
413-545-1931 fax

Turfgrass Lime and Fertilizer Recommendations

Periodic soil testing is an important part of any successful turfgrass management program. Since soil type, grass species, and desired turf quality level vary among turf areas; lime and fertilizer recommendations must be generalized to some extent. One must remember that a soil test is not an exact recipe for success. It should be incorporated into a coordinated effort to provide the cultural conditions required for healthy turfgrass. These include: (1) watering properly (amounts and timing); (2) insuring good drainage; (3) choosing seed carefully prior to establishment; (4) providing adequate light and air circulation; (5) using proper mowing techniques; (6) dethatching when necessary; and (7) preventing soil compaction. By liming and fertilizing properly and attending to the cultural requirements listed above one minimizes the chances for disease and weed problems and maximizes the likelihood of having healthy and attractive turfgrass.

Soil pH & Lime Recommendation – A soil of pH 4.0 is extremely acidic, while one of pH 8.5 is very alkaline. Though turfgrasses are adaptable to a wide soil pH range, they generally grow best at levels between 6 and 7. Ryegrasses and bluegrasses prefer a soil pH near 7. Bentgrassses and fescues perform best at pH levels near 6. Since the climate and rock-types of New England tend to produce acid soils, limestone is commonly recommended to raise soil pH.

It is unnecessary to lime soils in turfgrass unless the soil pH is less than 6.4. Liming soils to pH levels above 7.5 can result in micronutrient deficiencies (particularly if certain woody ornamentals are part of the landscape). Lime according to **your** recommendation. Since dolomitic (high magnesium) lime is so commonly available in our area, many soil tests show high magnesium levels. In these instances, a calcitic (calcium-rich) lime is often recommended. This can be difficult to find at lawn supply dealers. In this case, simply use the best available product. Although lime can be applied at any time of year, early spring is best for turfgrass. Late fall applications have been associated with the development of snow mold. Ground limestone and pelletized lime are the two most common liming agents used on lawns. Ground lime is usually cheaper, but the dust it produces can be a nuisance. Pelletized lime is more expensive (although prices have dropped), but "cleaner" with which to work. The choice of which to use is a personal one. Claims of superiority of one over the other are exaggerated.

Buffer pH, Cation Exchange Capacity, & Percent Base Saturation – **Buffer pH** is a measure of the soil's reserve acidity. A value higher than 6.8 indicates that very little or no acidity must be neutralized through liming. Values decreasing from 6.8 indicate increasing amounts of reserve acidity. An acid soil with a significant amount of organic and/or clay will have a lower buffer pH (thus higher lime requirement) than a sandy acid soil (with the same soil pH) with little organic matter. This is because lime must neutralize acidity residing on the surfaces of the humus (organic matter) and clay, before one realizes a rise in soil pH to the desired level.

The surfaces of soil particles are often electrically charged. The results in a soil's capacity to attract oppositely charged substances in the soil water surrounding them. Most often the soil is negatively charged and attracts positively charged ions (cations) to its surfaces. Calcium, magnesium, and potassium are examples of plant nutrients held in this way. These basic (not acidic) cations are available to plants. Acidic cations (e.g. aluminum and hydrogen) can also be adsorbed on the surfaces of soil particles. The sum of these is referred to as the soil's **Cation Exchange Capacity**

(CEC). A CEC of 10 to 15 is typical and usually adequate. It indicates that the soil has either a sufficient amount of humus (organic matter) or reactive mineral material (clay and fine silt). Values below 6 may indicate that the soil will have trouble supporting good turf growth unless special management techniques are employed. The proportion of basic cations held by the soil is referred to as **Percent Base Saturation.** A good balance is recommended. For example, a soil with base saturations of calcium 70%, magnesium 12%, and potassium 4% is considered well balanced. There are no strict limits, but a properly limed and fertilized soil will approach these values.

Organic Matter – The percentage of organic matter is determined only is requested. Organic matter in soils can improve nutrient and moisture retention, drainage, and aeration. It can also help prevent compaction. What level is appropriate will depend on the other characteristics of your soil and the turf management scheme employed. Values between 7% and 10% are generally acceptable. Building organic matter to an acceptable level is best accomplished prior to establishment. Contact the lab for more information.

Nutrient Levels

Nitrogen (N) – Nitrogen, as nitrate (NO_3-N) and ammonium (NH_4-N) are routinely measured as part of the soil test. These values, however, are not used to make nitrogen recommendations, but only used to detect extreme soil conditions. This is because nitrogen is a very dynamic and easily transformed element in soil. The turf's actual need for nitrogen additions may bear little relation to soil test levels. The best way to determine N need is to observe the color, density, and vigor of the turfgrass. If it is green enough for your tastes, is fairly dense, and is growing rapidly enough to require mowing once or twice a week in the spring and early fall, nitrogen is probably not currently needed. However, turf requires a regular supply of N to maintain quality. We recommend that a total of 3 lbs/ 1000 square feet be supplied each growing season, split over 3 or 4 applications.

Phosphorus (P) – Phosphorus appears on fertilizer bags as P_2O_5 (phosphorus pentoxide). Your recommendation is also expressed in this way. P fertility is most important during grass establishment, when good root development is vital. Since P does not move readily through the soil, it is important to incorporate sufficient P into the top six inches of soil prior to seeding new turf or laying sod. Fertilization of established turf will not increase quality as noticeably as will N, but moderate P soil levels should be maintained.

Potassium (K) – Potassium appears on fertilizer bags as K_2O (potassium oxide). Your recommendation is also expressed in this way. Turf deficient in K is unable to utilize nitrogen and water efficiently, and is more susceptible to disease, heat, cold, and drought stress. When possible, choose fertilizers containing potassium as the sulfate over those containing potassium chloride (muriate of potash). Potassium sulfate is less apt to "burn" turf if over applied.

Calcium (Ca) and Magnesium (Mg) – Properly limed soils usually have sufficient Ca and Mg.

Aluminum (Al) – Aluminum is toxic to some plants under acid soil conditions. It should not be a problem for turfgrass if the soil has been properly limed.

Organic Lawn Care – Interest has grown in organic methods of lawn care. The recommendations provided with your soil test (N, P_2O5, and K_2O) still apply. Organic amendments are generally lower in nutrient content, so target soil test levels may take longer to attain. We, however, encourage efforts in this area. More information on this topic is available in **Turf IPM Facts** (see below).

Micronutrient and heavy metal levels are not reported on your soil test report unless they are out of the normal range. If soil lead is elevated refer to the separate fact sheet enclosed with these results. For detailed information on Turfgrass Management we suggest you contact the UM Extension Bookstore at (413) 545-2717. The publications **Turf IPM Facts** and **Professional Turfgrass Management Guide** are excellent resources on lawn care.